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PATENT ABSTRACTS OF JAPAN

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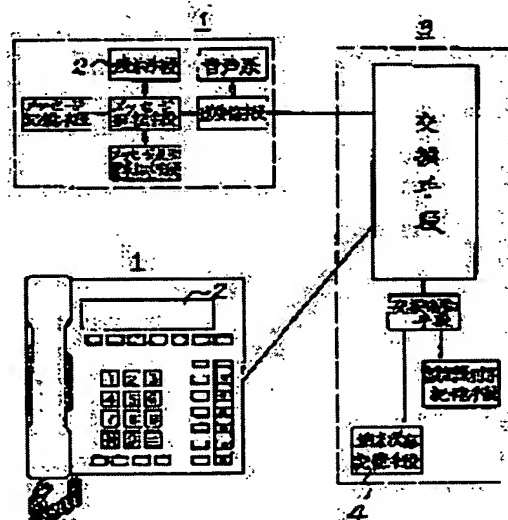
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(54) TELEPHONE EXCHANGE SYSTEM AND TELEPHONE TERMINAL EQUIPMENT USED BY THE SAME

(57)Abstract:

PURPOSE: To reduce a message transmission time by displaying display information on a display means of a caller terminal so as to relate a fixed message and a variable message to each other thereby reducing a message transmission amount.

CONSTITUTION: An exchange 3 has a 1st storage means 4 storing a message setting state of a telephone terminal 1, a 2nd storage means 4 storing a variable message and an identifier sent from a 1st transmission means, and a 2nd transmission means sending display information to display the fixed message and the variable message relating to each other to a caller terminal among telephone terminals 1. Then a caller terminal among the telephone terminals 1 has a display means 2 displaying the message, and when the caller terminal makes a call to a called terminal, it is discriminated by the exchange 3 that the message is set based on a message setting state of the 1st storage means 4, the fixed message and the variable message are displayed on the display means 2 of the caller terminal based on display information while relating them to each other.



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CLAIMS

[Claim(s)]

[Claim 1] It has the following. among the aforementioned telephone terminals a call origination terminal When it has the display means which can display the aforementioned message, a call is applied from the aforementioned call origination terminal to the aforementioned called station and it is judged that the message is set up based on the message setting situation of the storage means of the above first with the aforementioned swap device It is characterized by what the aforementioned fixed message and the aforementioned adjustable message are mutually associated using the aforementioned display information, and is displayed with the display means of the aforementioned call origination terminal. The telephone-exchange system in which message transmission use a storage means to memorize the identifier prepared corresponding to the fixed message and the aforementioned fixed message of at least 1, and the telephone line between the telephone terminals connected to the swap device boils a part at least, and according to the aforementioned identifier is possible. It is an input means by which a called station inputs an adjustable message among the aforementioned telephone terminals. A specific means to specify the identifier corresponding to a fixed message. The first transmitting means which transmits the adjustable message inputted by the aforementioned input means, and the identifier specified by the specific means. The aforementioned swap device is the second transmitting means which transmits the display information for associating and displaying mutually the second storage means, and the aforementioned fixed message and the aforementioned adjustable message which memorizes the adjustable message sent by the first storage means which memorizes the message setting situation in the aforementioned telephone terminal, and the transmitting means of the above first, and an identifier to a call-origination terminal among the aforementioned telephone terminals.

[Claim 2] Furthermore, the transmitting means of the aforementioned called station is a telephone-exchange system according to claim 1 which enables transmission of only the identifier corresponding to the aforementioned fixed message, and is characterized by the display of only the aforementioned fixed message being possible with the display means of the aforementioned call origination terminal.

[Claim 3] The aforementioned called station is a telephone-exchange system according to claim 1 characterized by having a content check means of a display to display the almost same content as the content of a display in the display means of the aforementioned call origination terminal by the aforementioned fixed message and the aforementioned adjustable message corresponding to the aforementioned identifier.

[Claim 4] The telephone terminal unit characterized by providing the following. An input means to input an adjustable message in the telephone terminal unit used by the telephone-exchange system displayed with the display means of a telephone terminal besides the above through the telephone line in the fixed message corresponding to the identifier which can be transmitted at least when a call is able to be applied from other telephone terminals and the message is set up. A specific means to specify the aforementioned identifier corresponding to the aforementioned fixed message. A transmitting means to associate mutually the aforementioned adjustable message inputted by the aforementioned identifier specified with the aforementioned specific

means, and the aforementioned input means in order to associate and display the aforementioned fixed message and the aforementioned adjustable message corresponding to the aforementioned identifier mutually with the display means of a telephone terminal besides the above, and to transmit.

[Claim 5] Only for the identifier further corresponding to [in order to enable the display of only the aforementioned fixed message with the display means of a telephone terminal besides the above] the aforementioned fixed message, the aforementioned transmitting means is [transmission] a telephone terminal unit according to claim 4 characterized by the possible thing.

[Claim 6] The telephone terminal unit according to claim 4 characterized by having a content check means of a display to display the almost same content as the content of a display in the display means of a telephone terminal besides the above by the aforementioned fixed message and the aforementioned adjustable message corresponding to the aforementioned identifier.

[Claim 7] When a call is applied to other telephone terminals with which the identifier corresponding to the fixed message which can be transmitted is specified through the telephone line, In the telephone terminal unit used by the telephone-exchange system by which the aforementioned fixed message is displayed at least with the display means of self by the aforementioned identifier sent from a telephone terminal besides the above It is the telephone terminal unit which carries out the feature of having a display means to associate and display the fixed message and the aforementioned adjustable message corresponding to the aforementioned identifier mutually with the aforementioned display means when the adjustable message is inputted at the telephone terminal besides the above.

[Claim 8] Display means. A storage means to memorize a correspondence relation with the identifier which discriminates a fixed message and the aforementioned fixed message. It is the telephone-exchange system equipped with the above. a dispatch telephone terminal The identifier corresponding to the aforementioned fixed message is followed. An input means by which an adjustable message can be inputted, A transmitting means to transmit the message information which consists of the aforementioned identifier and an adjustable message, and a received telephone terminal Based on an identifier, a fixed message is read from the aforementioned storage means a receiving means to receive the aforementioned message information, and among the aforementioned message information. It is characterized by having the control means which associate the aforementioned fixed message and the adjustable message of the aforementioned message information mutually, and are displayed with the aforementioned display means.

[Claim 9] The telephone terminal unit characterized by providing the following. A storage means to memorize a correspondence relation with the identifier which discriminates a fixed message and the aforementioned fixed message. A receiving means to receive the aforementioned identifier and an adjustable message. A display means to display any 1 at least among the aforementioned fixed message and the aforementioned adjustable message. Control means which read the fixed message corresponding to the aforementioned identifier which receives with the aforementioned receiving means, associate the aforementioned fixed message and the adjustable message of the aforementioned message information mutually, and are displayed with the aforementioned display means.

[Claim 10] Furthermore, it is the telephone terminal unit according to claim 9 which the aforementioned receiving means enables reception of only the aforementioned fixed message, and is characterized by the aforementioned display means enabling the display of only the aforementioned fixed message.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the telephone terminal unit used by the telephone-exchange system which can perform messaging, and this system.

[0002]

[Description of the Prior Art] There are a telephone, facsimile, etc. as communication media supporting an information society. Although such technology is very excellent, it also has a fault. For example, although the telephone had spread most widely and it was convenient equipment, only voice could be transmitted but the limitation was in the service which can be offered considering a system side. This was the same by facsimile. Moreover, there is voice mail to offer the service by the telephone which will seemingly be new. Although this voice mail was excellent in the point that a calling party can transmit information irrespective of the state of a called party, a medium called the voice which the telephone uses was used for it, and it did not pass over it for the usage depending on which telephones differ to be shown, but was inadequate also as service.

[0003] Moreover, the service to which information is made to transmit was able to be considered by sending a message to a partner telephone among these telephones using a thing with a drop, and displaying a message on this drop. However, since the message used here was fixed, while much more amount of information was required of the description, the thing without delay of the transmission time of a message was demanded.

[0004]

[Problem(s) to be Solved by the Invention] this invention removes the above fault, can tell a more concrete message, can cut down the amount of transmissions of this message while it can use media other than voice, and the message with which a display is presented by telephone which has spread most widely, and it aims at offering the telephone terminal unit used by the telephone-exchange system which can aim at shortening of a transmission time, and this system.

[0005]

[Means for Solving the Problem] The telephone-exchange system of the first this invention uses a storage means to memorize the identifier prepared corresponding to the fixed message and fixed message of at least 1. In the telephone-exchange system in which message transmission the telephone line between the telephone terminals connected to the swap device boils a part at least, and according to an identifier is possible among telephone terminals a called station An input means to input an adjustable message, and a specific means to specify the identifier corresponding to a fixed message, The first transmitting means which transmits the adjustable message inputted by the input means, and the identifier specified by the specific means, and a swap device The second storage means which memorizes the adjustable message sent by the first storage means which memorizes the message setting situation in a telephone terminal, and the first transmitting means, and an identifier, It has the second transmitting means which transmits the display information for associating and displaying a fixed message and an adjustable message mutually to a call origination terminal among telephone terminals. among

telephone terminals a call origination terminal When it has the display means which can display a message, a call is applied from a call origination terminal to a called station and it is judged that the message is set up based on the message setting situation of the first storage means with the swap device It is constituted by associating a fixed message and an adjustable message mutually using display information, and displaying with the display means of a call origination terminal.

[0006] Moreover, when the telephone terminal unit of the first this invention is able to apply a call from other telephone terminals and the message is set up, In the telephone terminal unit used by the telephone-exchange system displayed with the display means of other telephone terminals through the telephone line in the fixed message corresponding to the identifier which can be transmitted at least In order to associate and display the fixed message and adjustable message corresponding to an identifier mutually with an input means to input an adjustable message, a specific means to specify the identifier corresponding to a fixed message, and the display means of other telephone terminals It is constituted by having a transmitting means to associate mutually the adjustable message inputted by the identifier specified with the specific means, and the input means, and to transmit.

[0007] When the telephone terminal unit of the second this invention applies a call to other telephone terminals with which the identifier corresponding to the fixed message which can be transmitted is specified through the telephone line, In the telephone terminal unit used by the telephone-exchange system by which a fixed message is displayed at least with the display means of self by the identifier sent from other telephone terminals When the adjustable message is inputted at other telephone terminals, it is constituted by having a display means to associate and display the fixed message and adjustable message corresponding to an identifier mutually with a display means.

[0008] The telephone-exchange system of the second this invention contains two or more telephone terminals which have a display means and a storage means to memorize a correspondence relation with the identifier which discriminates a fixed message and a fixed message. It is the telephone-exchange system which performs messaging, a dispatch telephone terminal A transmitting means to transmit the message information which consists of an input means by which an adjustable message can be inputted, and an identifier and an adjustable message, following the identifier corresponding to a fixed message, and a received telephone terminal It is constituted by having a receiving means to receive message information, and the control means which read a fixed message from a storage means based on an identifier among message information, associate a fixed message and the adjustable message of message information mutually, and are displayed with a display means.

[0009] A storage means to memorize a correspondence relation with the identifier from which the telephone terminal unit of the third this invention discriminates a fixed message and a fixed message, A receiving means to receive an identifier and an adjustable message, and a display means to display any 1 at least among a fixed message and an adjustable message, The fixed message corresponding to the identifier which receives with a receiving means is read, and it is constituted by having the control means which associate a fixed message and the adjustable message of message information mutually, and are displayed with a display means.

[0010]

[Embodiments of the Invention] Next, the example of this invention is explained according to a drawing.

[0011] The system concerning this example is shown in drawing 2 . This system consists of the telephone terminal (hereafter, when calling it a telephone terminal, it considers as this type of thing in principle.) (11) equipped with the display, and an exchange system (13). In this system, if the input directions of the message are carried out in the telephone terminal (11) of 1, a transfer indication of the message will be given to other telephone terminals (11). It is the case of the call origination from other telephone terminals (11) to the telephone terminal (11) of 1 that a message is transmitted, when it is sending out of the direct message to other telephone terminals [terminal / (11) / telephone / of 1] (11). As later mentioned about a transfer of a message, the point using an identifier is one feature of this invention.

[0012] Next, the system is explained in full detail. First, the exchange system (13) contains the line card (15) which leads a telephone terminal (11) to an exchange system (13), as shown in drawing 2. Between the line card (15) and the telephone terminal (11), it connects by two-wire system bidirectional burst transmission (ping-pong transmission) so that it may mention later. In addition, the electric power supply line is omitted in drawing 2. To the same line card (15), the telephone terminal (11) of plurality (2-4 pieces) is connected. From the line card (15), the PCM highway (17) is prolonged in the time switch circuit (19).

[0013] Not only a line card (15) but a trunk card (21), a tone circuit (23), and a meeting circuit (25) are connected to this time switch circuit (19) through a PCM highway (27), (29), and (31). The sound signal or the data signal has ridden on the PCM highway.

[0014] A time switch circuit (19) makes a change of the time slot about the signal of a PCM highway (17), (27), (29), and (31) etc.

[0015] A trunk card (21) is a card to which a main wire, a dedicated line, etc. are connected.

[0016] A tone circuit (23) sends out various tones to a telephone terminal (11) and a main wire. Various tones are supplied from this circuit (23) as a digital signal.

[0017] A meeting circuit (25) performs the operation in the case of performing a telephone call of three or more persons.

[0018] In addition, a reference clock is supplied to a line card (15), a time switch circuit (19), a trunk card (21), a tone circuit (23), and a meeting circuit (25) from a clock generation machine (26), and operation is specified in them. The control line of a couple is connected to the line card (15), the trunk card (21), the tone circuit (23), and the meeting circuit (25). The other end of the control line is connected to I/O (33).

[0019] The common bus (35) is prepared to I/O (33), and CPU (37), a floppy disk (FD), (39), memory (41), and the I/O circuit (43) are hanging down from this common bus (35).

[0020] The program of exchange control action and various data are memorized by the floppy disk (39). The contents of storage of a floppy disk (39) are loaded to memory (41), and CPU (37) operates according to the contents of storage in memory (41). The floppy disk (39) is used as an object for backup of memory (41).

[0021] The data terminal (45) is connected to the I/O circuit (43). A data terminal (45) is used for a customer entry of data and maintenance control which are mentioned later. Customer data are attribute information, such as functional assignment of a key, by the classification of a telephone terminal, the telephone number, and each functional telephone. Moreover, in this example, a message is also inputted from this data terminal (45).

[0022] Next, the transmission system between a telephone terminal (11) and a line card (15) is explained.

[0023] As mentioned above, in this example, a two-wire bidirectional burst transmission method is used. By this method, the signal is sent and received like ping-pong between a telephone terminal (11) and an exchange system machine (line card (15)). As shown in drawing 3, the signal of a predetermined format is transmitted to a telephone terminal (11) in the shape of a burst from a line card (15). On the other hand, a signal is transmitted to a line card (15) in the shape of a burst from a telephone terminal (11). This is performed in 125microsec.

[0024] Next, the signal format in this transmission system is explained. As shown in drawing 4, one frame is formed by 12 bits. 1 bit [of a head] a frame synchronization bit (F) and the following 8 bits (V) are assigned to a sound signal. Then, 1 bit (D) is assigned to data, 1 bit (C) is assigned to a control signal, and 1 bit of the last is an object for parity (P).

[0025] If only a sound signal is seen, 8 bits will be transmitted for every 125microsec, and 64kbpsPCM real-time transmission will be realized. A data terminal etc. is connected to a telephone terminal (11), and data (D) are used when also performing data transmission simultaneously using the telephone line. What is necessary is just to use the bit for sound signals (V), when not performing voice transmission.

[0026] Usually, a control signal bit (C) is a signal for control of a telephone terminal (11), and constitutes one unit by 12 bits. That is, the control signal shown in drawing 5 is obtained by receiving the signal of the format shown in drawing 4 12 times, and accumulating 12 control-bit C (12 multi-framing composition). With this, conversely, transmission is divided into each bit and

should just transmit. Parity (P) is a bit for a parity check.

[0027] as mentioned above, a telephone terminal (11) and a line card (15) — although, as for a transmission system in the meantime, two-wire bidirectional burst transmission (ping-pong transmission) is adopted, as for each signal, the phase coding is given on the transmission line. The phase coding is coding from which the level changes synchronizing with a clock, the signal level is fixed in the same clock section, and the signal level moreover changes to "0" to "1" in the same clock section.

[0028] The example as which DP signal train is specified to an NRZ signal train is shown in drawing 6 (a) and (b). In addition, it only means that a duty ratio expresses an NRZ signal here at 100% to data. Therefore, what is necessary is just to consider an NRZ signal train as digital data in a telephone terminal (11) and a line card (15) here. In addition, about required hardware composition, it mentions later.

[0029] Next, a telephone terminal (11) is explained further in full detail. The appearance of a telephone terminal (11) here is the feature that the point equipped with LCD (51) as shown in drawing 7 is big. Softkey (53) ***** (63) is prepared in the bottom of this LCD (51). One softkey (65) is prepared out of LCD (51). The function of this softkey (53) ***** (65) is assigned according to the state of a terminal. The name of the function assigned by the state of a terminal is displayed on the portion corresponding to softkey (53) ***** (63) in LCD (51).

[0030] Function key (67) ***** (79) other than this softkey (53) ***** (65) is prepared. Various functions are programmably assigned to this function key (67) ***** (79). Light Emitting Diode (81) ***** (93) which shows the state of (67) ***** (79) of this key is prepared in the right-hand side of this key (67) ***** (79).

[0031] Furthermore, function key (95) ***** (101) other than function key (67) ***** (79) is prepared. Function key (67) ***** (79) and (95) ***** (101) are not the things of the property which functions, such as a fixed function, for example, auto dialing etc., are assigned fixed, and is assigned according to the state of a terminal.

[0032] The dial pad (102) is prepared in the case up center section of the telephone terminal (11).

[0033] Moreover, the headset (105) is prepared for the loudspeaker (103) in case up left-hand side. This headset (105) is connected to the case through the code (107). Such a telephone terminal (11) is connected with the exchange (line card (15)) through the telephone line (102).

[0034] Next, the electronic composition of a telephone terminal (11) is explained according to drawing 8. Here, a data terminal (111) is connected to a telephone terminal (11), and an example equipped with a drawing phone tablet input unit (113) is explained.

[0035] This terminal (11) consists of a ping-pong transmission system (115), a voice system (117), an operation system (119), and a processor (121). A ping-pong transmission system (115) sends and receives a signal between the telephone lines (109), exchanges voice data with a voice system (117) further, and considers digital data as an exchange with a processor (121) and a data terminal (111). A voice system (117) performs conversion with a digital signal and voice. An operation system (119) can be considered as a man machine interface of an operation table and a processor (121). A processor (121) controls operation of the whole terminal (11) while performing fixed processing to data.

[0036] A voice system (117) contains a headset (105) and a loudspeaker (103). This voice system (117) is control and the timing signal T2 of CPU (125) in a processor (121). (it mentions later) The PCM voice data from a ping-pong transmission system (115) is changed into an analog sound signal with a codec & filter (127) under control. This analog sound signal is sent to a headset (105) or a loudspeaker (loudspeaker) through a buffer amplifying circuit (129), and serves as audible sound. A codec (codec) is the thing equipped with both the functions of an encoder (coder) and ***** (decoder), and is PCM sign *****. Control of CPU (125) to this codec & filter (127) is performed through I/O (131) for common path (123) voice.

[0037] The analog sound signal sent from a headset (105) is sent to the transmitting frame register (133) of a ping-pong transmission system (115) through a codec & filter (127). The output of a transmitting frame register (133) is sent to a parity addition circuit (135). The output of a parity addition circuit (135) is sent to a NRZ/DP conversion circuit (137), and is sent out

through a hybrid (139) to the telephone line (109).

[0038] The above is a transmitting portion among ping-pong transmission systems (115).

[0039] On the other hand, at the time of reception, the output from a hybrid circuit (139) is supplied to an DP/NRZ conversion circuit (141). The output of an DP/NRZ conversion circuit (141) is sent to a receiving frame register (143). A receiving frame register (143) has each field the object for sound signals (V), the object for data (D), and for control signals (C).

[0040] They are 8 bits of each number of bits, 1 bit, and 1 bit. The data of the field for sound signals (V) serve as an input of a codec & filter (127) among receiving frame registers (143). Similarly the data of the field for data (D) are sent to a data terminal (111) through I/O (RS232C) (145). The data of the field for control signals (C) are sent to 12 bit-shift register (SR) and (147).

[0041] A transmitting frame register (133) is also the same composition, and consists of the 8 bits field for sound signals (V), the 1 bit field for data (D), and the 1-bit field for control signals (C). The output of the above-mentioned codec & filter (127) is inputted into the field for sound signals (V) of a transmitting frame register (133). The data from a data terminal (111) input into the field for data (D) through I/O (145). The output from 12 bit-shift register (149) inputs into the field for control signals (C). 12 bit-shift register (147) and (149) are connected with the common bus (123).

[0042] Next, operation is explained. The 8-bit PCM sound signal from a codec & filter (127) is once memorized to the field for (sound signals V) in a transmitting frame register (133).

[0043] On the other hand, from CPU (125), control data is sent per 12 bits and is once memorized by 12 bit-shift register (149) through a common bus (123). The every 1 bit data from this 12 bit-shift register (149) are memorized to the field for control signals (C). Data sending out from 12 bit-shift register (149) is 1 time of a rate at 125microsec. This is controlled by the timing signal T1. Data sending out from I/O (145) the data from a data terminal (111) are remembered to be to the field for data (D) through I/O (145) is also a timing signal T1. It is controlled. Thus, if 10-bit data are prepared, in a parity addition circuit (135), a frame synchronization bit (F) and 1 bit (P) of parity bits will be added, respectively. This format is the same as the format shown in drawing 4. This data is outputted in the form of 100% of duty ratios. This serves as an NRZ (Non-Return-To Zero) signal and a highly uniform. This signal train is NRZ. The phase coding is given by DP conversion circuit (137). Then, it is sent out through a hybrid circuit (139) to the telephone line (109).

[0044] At the time of reception, the signal with which the phase coding was given is changed into an NRZ signal train from a hybrid circuit (139) in an DP/NRZ conversion circuit (141).

[0045] This signal is a 12-bit unit, a frame synchronization bit (F) parity bit (P) is excepted, and data of the 9th bit of the 2-bit **** are memorized from a head to the field for sound signals (V). Then, the 10th bit is memorized to the field for data (D), and the 11th bit is memorized to the field for control signals (C). The data of the field for sound signals are inputted into a codec & filter (127), and are changed into audible sound as mentioned above.

[0046] The data of the field for data are sent to a data terminal (111) through I/O (145). The data of the field for control signals are sent to 12 bit-shift register (147), and if 12 bits is accumulated, they will be sent to CPU (125) through a common bus (123).

[0047] An operation system (119) contains the LCD controller (151) which carries out drive control of the LCD (51). The key input information from a dial pad (102), softkey (53) **** (65), function key (67) **** (79), and (95) **** (101) is told through an I/O (153) common bus (123) to CPU (125). Moreover, CPU (125) which acquired information about the operation state of function key (67) **** (79) gives an instruction so that predetermined Light Emitting Diode (81) **** (93) may be displayed on a Light Emitting Diode drive system (155) while performing predetermined processing.

[0048] CPU (125) performs predetermined processing according to the program memorized by ROM (157). Moreover, a data terminal (111) exchanges data through I/O (145) and I/O (159). The input configuration information from a drawing phone tablet input unit (113) is told through I/O (159) to CPU (125).

[0049] Next, the concrete composition of a NRZ/DP conversion circuit (137), a high Brit circuit

(139), and an DP/NRZ conversion circuit (141) is explained according to drawing 9.

[0050] These circuits (137), (139), and (141) are electrically connected with the telephone line (109) through a high Brit coil (161). And it consists of the transmitting section (163) centering on a NRZ/DP conversion circuit (137), and the receive section (165) centering on an DP/NRZ conversion circuit (141).

[0051] The signal from the telephone line (109) is acquired as digital data by such composition, the phase coding is given and digital data is sent out to the telephone line (109).

[0052] Next, the clock of a telephone terminal (11) of operation is explained. In this example, clocks of operation have been obtained from the frame detector (167) and timing-control circuit (169) which are shown in drawing 8. That is, a frame synchronization bit is detected from the signal received in the frame detector (167), and a clock signal is generated synchronizing with this detection timing. This responds to the above-mentioned frame detection from the clock signal from the clock generation machine (prepared between timing generating circuits (169).) which is not illustrated, and is a timing signal T1. -T4 It generates.

[0053] Timing signal T1 8kHz, timing signal T2 64kHz, timing signal T3 256kHz, timing signal T4 It is a 2MHz clock signal. Moreover, since data are written in from a codec & filter (127), I/O (145), and 12 bit-shift register (149) and data are read to a parity addition circuit (135) to a transmitting frame register (133) as mentioned above, naturally it is necessary to shift a phase about this writing and read-out. The same is said of a receiving frame register (143).

[0054] Next, a line card (15) is explained according to drawing 10. This line card (15) is equipped with a hybrid circuit (201), a transceiver circuit (203), and a receiving frame register (205). The composition of a hybrid circuit (201) and a transceiver circuit (203) is the same as the concrete composition shown in drawing 9. That is, coding of the signal of the telephone line (109) is solved, it changes into an NRZ signal, and an NRZ signal is conversely changed into a die phase signal (DP signal). You may consider an NRZ signal to be digital data identically here. In a synchronizing signal detector (204), the signal with which the die phase sign was solved detects a frame synchronization bit (F), and loads an NRZ signal to a receiving frame register (205) based on this signal.

[0055] At this time, the data of a 2-bit **** 9 bit view are memorized from a head (it counts from a frame synchronization bit (F)) to the field for sound signals. The bit [10th] data are memorized to the field for data. The bit [11th] data are memorized to the field for control signals. Next, the data of the field for sound signals and the field for data are transmitted to a register (207) and (209). Multi-PUREKUTA (213), a counter (215), and a comparator (217) are formed to this register (207) and (209). A register (207) and (209) send out storing data to a multiplexer based on a clock signal. This clock signal is supplied through the clock signal line (219) from the clock generation machine (26) shown in drawing 2. This clock signal is supplied also to a counter (215), and counting is carried out in a counter (215). A counter (215) is initialized by the frame synchronization signal of PCM. This PCM frame synchronization signal is sent from I/O (33) through a frame signal line (221).

[0056] What is necessary is just to think that it is prepared together as a PCM highway (17) etc. by drawing 2, although omitted. Therefore, the counter (215) carries out counting of the clock signal from the head of the frame of PCM, and coincidence detection with the value defined beforehand is performed in a comparator (217). This value defined beforehand is the peculiar address defined for every line card, and is also the number of the time slot assigned to each line card (or telephone terminal (11)) so that it might mention later.

[0057] in addition — the case where two or more telephone terminals (11) are set up to the line card (15) — in this way — a comparator (217) — setting — the peculiar address and counting — if the number of clock signals is in agreement, a multiplexer (213) and the demultiplexer (223) mentioned later will be told about this result In response, a multiplexer (213) multiplexes a register (207) and the contents of (209), and sends them out to a PCM highway (17). This PCM highway (17) is connected to the time switch circuit (19) as mentioned above.

[0058] On the other hand, the control signal memorized to the field for control signals of a receiving frame register (205) is accumulated at 12 bit-shift register (211). If accumulated by 12 bits, it will be sent to CPU (227) through a bus (225) as one control signal.

[0059] If CPU (227) is decoded by fixed processing and has the need according to the contents of storage of memory (229), it sends out the contents to a data highway (233) through I/O (231). The data sent out to the data highway (233) are sent to CPU (37), and predetermined processing is performed.

[0060] Although the above is transmission from a telephone terminal (11) to an exchange side, transmission to a telephone terminal (11) from an exchange side is explained below. Time Division Multiplexing of the PCM voice data sent through a PCM highway (17) is carried out. This data is incorporated in a line card (15) in a demultiplexer (223). As mentioned above, the peculiar address is assigned and each line card (15) also has a number of the time slot by which this was assigned to each line card (15). As mentioned above, with a comparator (217), when coincidence with the clock value which carried out counting, and the peculiar address is obtained and it is in agreement from the start of the frame of PCM, a demultiplexer (223) is also told about this result. In a demultiplexer (223), in response, a receiving PCM signal is divided into voice and data, and it transmits to a register (235) respectively (237). A register (235) and (237) operate in response to supply of a clock signal from a clock signal line (219).

[0061] The data sent through a data highway (233) are data required for exchange control, and are distinguished from the data transmitted through the above-mentioned PCM highway (17). The data sent through a data highway (23) are sent to CPU (227) through I/O (231), and are accumulated further at a register (239). Next, the content of a register (235), (237), and (239) is transmitted to a transmitting frame register (241). This transmitting frame register (241) is divided into three fields, and that of ***** is the same as a receiving frame register (205) or the receiving frame register (133) in a telephone terminal (11).

[0062] The contents of this transmitting frame register (241) are sent to a transceiver circuit (203). In this circuit (203), the phase coding is given and data are sent out to the telephone line (109) through a hybrid circuit (201). Next, messaging is explained. In this example, a message is separated as a fixed portion and a variable part, and the identifier is expressing the former. Furthermore, in this example, one feature is in the point that the above-mentioned identifier mainly performs messaging. Correspondence with an identifier and the fixed portion (it is called a fixed message below) of a message is set up as shown in Table 1 (it is called an identifier table below).

[0063]

[Table 1]

識別子	固定メッセージの内容
1	ガイシユツ
2	ガイシユツ _____ キジャ
3	キュウカ
4	シユツチヨウチユウ _____ シユツジャ
5	カイギチユウ _____ マデ
6	オキヤクサンデス _____ ヒシヨ
⋮	
n	_____ ヘデソウシテクダサイ

The portion to which the underline was given is a variable part of a message among the fixed message of Table 1. Thus, having divided the message into the fixed portion and the variable part

notes that the required message is patternized in everyday life and business.

[0064] A variable part is not necessarily surely required. The maintenance storage of the correspondence of this identifier-fixed message is carried out at least at all the display affair telephone terminals (11). There are two kinds in the method of this storage.

[0065] One is the case where it memorizes to ROM, and another is the case where it memorizes to RAM. The first example explains the example which made ROM memorize the above-mentioned correspondence.

[0066] Since ROM is the memory only for read-out, it needs to make the above-mentioned correspondence memorize beforehand, and it is necessary to equip each terminal (11) with it. In this case, although it is not necessarily required in an exchange side to have this correspondence beforehand, the same contents of storage as ROM in a terminal (11) are stored in memory (41) or a floppy disk (39) here. About an initial input, it mentions later.

[0067] Next, messaging is explained. There are two kinds of modes in messaging in this example. It considers as message setting demand mode, and is message sending-out demand mode. The telephone terminal (11) operator itself is an absence etc., message setting demand mode sets up the message beforehand, when a telephone (11) cannot be answered after this, and from the terminal (11) of **, when call origination is carried out, it transmits the above-mentioned message to this calling party.

[0068] Message sending-out mode sends out a message to the calling party, when call origination is carried out to other terminals (11) and a calling party does not answer.

[0069] First, message setting demand mode is explained. In order to perform this mode, the key (65) of a telephone terminal (11) is operated first. This key (65) is message setup / selection key. If this key (65) is pushed at first, CPU (125) of a telephone terminal will make this operation state detection people and message setting mode. In this mode, CPU (125) calls the contents of an identifier "1" from an identifier table, and displays them on LCD (51). Here, "guy SHUTSU and the vest" corresponding to an identifier "1" are displayed. Since this is not a now required message, an operator pushes message setup / selection key (65). Then, the contents of an identifier "2" are displayed. If the same operation as the following is repeated and the contents of an identifier "5" are displayed, an operator will push a check key. As a check key, the inside's of a dial pad (102) may be used, and one may be suitably chosen and set up from function key (67) - (79), (95) - (101) inside. Moreover, you may assign a function to one of the softkey (53) **** (63). A setup of a fixed message was completed now.

[0070] Next, an adjustable message "03:00" is inputted. This pushes a dial pad (102) with "0", "3", "0", and "0". CPU (125) is displayed on the field to which the underline in the message currently displayed on LCD (51) was given in this "0", "3", "0", and "0" as 03:00. Then, it is displayed as "KAIGICHUU 03:00 MADE." At this time, CPU (125) memorizes the identifier "5" and the adjustable message "0300" as "50300" to RAM (156). Simultaneously, this "50300" is sent out as data to the exchange.

[0071] This is explained in more detail. Sending out of this data is performed like sending out of the control signal of a telephone terminal (11). In this example, since the ping pong transmission system is adopted, the bit for control signals under format shown in drawing 4 will be used. Moreover, the data itself used here consider as one unit by 12 bits. First, CPU (125) sends a message setting demand to the exchange. An example of this setting demand is shown in drawing 14. It is C0 although it is one unit in 12 bits here. The bit for frame synchronization, C1 C2 The bit which shows the meaning which this 12-bit data expresses, and the data C11 which C3-C10 send out are the bits for parity checks (this example even number).

[0072] Such 12-bit data are sent out to 12 bit-shift register (149) (shown in drawing 8) from CPU (125), and it is sent out to the exchange by the above-mentioned procedure. Then, the identifier number of a message, variable data (time in a message, days and months, etc.), and a message setting end are sent out. In an exchange side, a line card (15) receives and the above data are sent to CPU (37).

[0073] After CPU (37) receives and recognizes a message setting demand, it recognizes the identification number of a message, and a variable data, and memorizes them to the message registration field of memory (41). The composition of the message registration field of this

memory (41) is explained. It constitutes from port correspondence and a message registration field consists of this example also in consideration of customer data.

[0074] This example is shown in drawing 12.

[0075] A port points out the output terminal for example, by the side of the terminal (11) of the line card (15) of drawing 2. What is necessary is just to use the number which added 2 bits to the above-mentioned peculiar address here, when calling it a port number. Customer data are attributes, such as functional assignment of the classification of a telephone terminal (11), a state, the telephone number, and a key. As a classification of a terminal (11), they are the usual dial telephone, a push-button phone, a telephone with a display, a telephone with a data terminal (for example, computer phone), etc. The state of a telephone terminal (11) is the concept of level of being used with a state transition diagram, and as shown in drawing 13 and Table 2, it is in the state of the terminal (11) seen from the standpoint of exchange control. In this example, the feature is in the point of having established the state of calling it "under a message set" as a state "7."

[0076]

[Table 2]

0	空 き	4	通 話 中
1	ダイヤルトーン	5	リジートーン
2	ダイヤル受信	6	規 制 中
3	相手呼出中	7	メッセージセット中

A message is memorized during a set to such customer data dealing with a port. A message consists of the fixed-data section and the variable-data section which consist of an identifier during this set. Here, they are an identifier "5" and the variable-data section "0300."

[0077] Thus, when the inside of the exchange is set up, suppose that call origination was carried out to the message sending-out terminal (11) from terminals (11) other than the terminal (11) which sent out the message. CPU in the exchange (37) receives the call origination from a terminal (11), and searches the customer data dealing with a port. This search investigates the state of a call origination-ed terminal. Although a line connection will be performed if it is a state "0", a terminal "5" is a state "7" here and, as for CPU (37), it recognizes that it is [message] under setup.

[0078] Then, a message is called during a set and the data "50300" are sent out as control data to a call origination terminal. The sending-out procedure at this time is the same as the sending-out procedure from the terminal at the time of a message setup (11) to the exchange, and CPU in the exchange (37) sends the above-mentioned control data to a call origination terminal through a line card (15) etc. by the format shown in drawing 14. Between the line card (15) and the telephone terminal (11), the ping pong transmission system is used as mentioned above.

[0079] In CPU (125) of the terminal which received the message transfer, after recognizing control data, the contents of an identifier table are called from memory (157) using an identifier. Here, it corresponds to "5". "KAIGICHUU : MADE" will be called. However, it is "KAIGICHUU" in case an identifier table is made to memorize. : it is also good to memorize the character corresponding to MADE" as it is, to prepare a character generator independently and to memorize character code.

[0080] Next, CPU (125) displays the fixed message and variable data which were called on LCD (57). Thus, to it, it means that the display "KAIGICHUU 03:00 MADE" accomplishes to a call origination terminal, and the transfer of a message and the display had accomplished. You may make it display the number of a call origination-ed terminal, a call origination-ed terminal-handling person, etc. simultaneously with such a display.

[0081] Next, message sending-out demand mode is explained. This is the required mode to

contact urgently even while a call origination-terminal is talking over the telephone. For example, it is a time of a secretary wanting to contact a superior official urgently and to tell a visitor. In such a case, to a call origination-terminal, a busy tone is sent out from the tone-circuit (23) of the exchange. If such a busy tone is received, CPU (125) of a telephone terminal (11) will assign each function of a camp-on, automatic call return, a re-call, a message transfer, and interruption to key (53) - (63). Simultaneously, CPO (camp-on), ACB (automatic call return), RCL (re-call), LMG (message transfer), and OUR (interruption) are displayed on the portion corresponding to key [in LCD (51)] (53) - (63).

[0082] Next, an operator pushes a key (59). In this state, this softkey (59) is a message transfer key, and will transmit the message created by the following processings to the call-ed point by pushing this key (59).

[0083] First, a setup of a message is displayed to CPU (125). And like the above-mentioned message setting demand mode, an identifier table is called and it is displayed from the content of an identifier "1." And the fixed portion of a message is decided by operation of a key (65) and a dial pad (102). Here, an identifier "6" shall be chosen. In this example, a message is first sent out to the exchange according to the procedure and format which are unnecessary as for a variable data and are shown in drawing 15. In CPU (37) of the exchange, recognition of a message sending-out demand sends out the data of the format shown in drawing 15 to ***-ed as control data of a terminal (11) as it is.

[0084] By doing in this way, even if a called station is talking over the telephone (again what state), since a message can be transmitted and moreover uses an identifier, it can also cut down the amount of transfers sharply. Although the above-mentioned example explained the example which makes ROM memorize an identifier table, naturally RAM (Random Access Memory) can also be made to memorize. And it has the effect it is ineffective to it being clear from the following explanation in this case.

[0085] In the explanation shown below, in an initial state, correspondence of an identifier-message shall not be memorized by each telephone terminal (11) at the same time it inputs correspondence of an identifier-message into the floppy disk in the exchange (39) from a data terminal (45). Hardware-composition presupposes that it is the same as that of the above-mentioned example.

[0086] First, the correspondence-related input of the identifier-message to floppy DIKUSU (39) is explained. A data terminal (45) is a terminal for maintenance, and when writing in a message from this terminal (45), it inputs an authorization code. For example, when an authorization code is "0003", the following processings are diagnoses, and when it is "0002", it decides like the writing of a message at the set of customer data, and the time of "0001." Here, if an authorization code "0001" is inputted, CPU (37) will recognize it as the data after this being an identifier number and a message (fixation). Therefore, this content is memorized into the portion which consisted of RAM of a floppy disk (39) or memory (41). This content of storage is not limited to the 1st table.

[0087] Thus, if correspondence with an identifier number and a message is determined, processing which transmits this content of storage to each telephone terminal (11) will be performed. But there is no direct relation with when the information about the message in the exchange is prepared, as for the concept of a transfer. That is, naturally within the exchange, the above-mentioned content may be accumulated to ROM.

[0088] Now, as for a transfer of the above-mentioned content of storage (correspondence with an identifier number and a message), it is desirable at the time of power supply starting of the exchange to carry out at the time of change of a message and new matter addition etc. at the time of a new terminal connection. First, the transfer at the time of power supply starting is explained. When the power supply of the exchange is switched on, the exchange program memorized by the floppy disk (39) and required data (the data about the above-mentioned message may also be included) are loaded, and memory (41) is made to memorize, as shown in drawing 16. Next, the initial program mentioned later considers as a start, and I/O processing, the message exchange, background processing, error processing, etc. are performed by the supervisor after completing processing by this program according to priority.

[0089] Next, an initial program is explained.

[0090] This program is first started from processing in which initialization of the whole hardware, especially the memory of a data area are cleared, as shown in drawing 17.

[0091] This is because the content of the initial state of a data area is not guaranteed only in an exchange program and loading of required data. A data area is a data storage field about mounting states, such as a line card shown below, and memory is initialized in advance of the right data storage by the above-mentioned clearance.

[0092] Next, mounting states, such as a line card (15) and a trunk card (21), are checked. For this reason, it asks from CPU (37) and a signal is sent out to a line card (15) and a trunk card (21) using a control signal line (data highway). On the other hand, CPUs (227), such as each line card (15), return answer of being mounted to CPU (37). This answer should just use what omitted 2 bits of low ranks of the peculiar address which should just use the peculiar number given to each line card (15), and which are used as a reference value of the comparator (217) shown in a view 10 as a peculiar number.

[0093] Originally this peculiar address is set up to a telephone terminal (11) and a (port) here having thrown away 2 bits of low ranks. In this example a line card (15) is discriminated by writing that four terminals (11) connect with one line card (15) by things other than 2 bits of low ranks of the peculiar address, it includes to 2 bits of low ranks, and even the telephone terminal (21) is discriminated. Since expression of the peculiar address will also change if the number of terminals (11) connected to a line card (15) naturally changes, expression of a peculiar number here also changes. When CPU (37) receives such a response, mounting of a line card (15) etc. is checked.

[0094] By this, CPU (37) obtains the map about mounting of a card. Next, the check of the connection state of a telephone terminal (11) is explained.

[0095] CPU (37) of the exchange is sent out to each terminal (11) by making an inquiry signal into a control signal. The format of the inquiry signal in this example of following drawing 5 is natural. On the other hand, CPU (125) of a telephone terminal (11) is sent out to the exchange, for example by considering a self specific number as an answer, if an inquiry signal is received. (About this, it mentions later further.)

CPU (37) builds the map about the mounting state of a terminal (11) in response to this response. An example of the response to an inquiry signal and this is shown in drawing 18. Thus, the mounting state about a card (15) and a terminal (11) is checked, and CPU (37) can complete a mounting map.

[0096] Next, CPU (37) initializes a telephone terminal (11). By this initialization, transmission and reception of a telephone terminal (11) are attained. Then, CPU (37) is read from a floppy disk (39), reads the data about the message memorized by memory (41), and sends them to a terminal (11).

[0097] This data transfer is performed as a transfer of the control data to a terminal (11). The data format at this time is shown in drawing 20.

[0098] CPU in the exchange (37) emits first the message storage demand instruction which consists of 12 bits. It is received by CPU (227) in a line card (15), and this is once accumulated at a register (239). Then, it is sent to a terminal (11) through the telephone line (109) using the bit for control signals under ping-pong transmission format. At a terminal (11), it is sent to CPU (125) through a receiving frame register (143), 12 bit-shift register (147), etc.

[0099] By such procedure, the above-mentioned message storage demand, the identifier number of a message, and a message are sent to a terminal (11) one after another. CPU (125) of a terminal (11) memorizes the identifier and the message in RAM (156). And this processing will be terminated if a message storage end instruction is received.

[0100] In this way, CPU (125) of a telephone terminal (11) accumulates the sent data to RAM (156). By this, the exchange and a telephone terminal (11) will completely hold the same identifier and the same message. An initial program is ended now and an exchange program usually starts.

[0101] CPU (37) is updating the mounting map the fixed period in principle using the idle time of the message exchange. That is, connection of a new terminal (11) is performed and a change

(change of a connection port) of the connecting location of a terminal (11) to the exchange is made. If this is obtained by port correspondence, it will call it automatic change of customer data. When especially a new terminal (11) is connected to the system which the exchange governs and change of customer data originates, an identifier and a message are transmitted to the new terminal (11) concerned like the above-mentioned initial program. At a new terminal (11), the transmitted data will be accumulated to RAM and the exchange and the same data as the terminal (11) of ** will be held.

[0102] Here, the check of whether the terminal (11) is connected is explained in detail. The exchange is performing the inquiry for confirming whether the terminal is connected or it does not connect to each port the fixed period. To this inquiry, when a terminal answers, the exchange recognizes that the terminal is connected to the port.

[0103] It asked drawing 21 and the flow chart showed operation of the exchange at the time. At the time of usual (except [the time of connecting a terminal, and when a terminal is extracted]), the exchange is asking one by one to each port. When a terminal is connected to the exchange and it sees from the exchange, a response will come on the contrary suddenly from the port which did not have a response till then. In this case, if the exchange repeats an inquiry 3 times in the same port and has a response to all, it will recognize it as the terminal having been connected to the point of the above-mentioned port.

[0104] When a terminal is extracted from the exchange (the terminal was cut) and it sees from the exchange, a response stops on the contrary, returning suddenly from the port to which the normal response was returned till then. In this case, if the exchange sends out an inquiry 3 times in succession and there is no response to all to the same port, it will recognize it as the terminal connected to the above-mentioned port having been extracted.

[0105] The case where a multirole key telephone system is newly connected to the exchange is explained. A multirole button shall be connected to the telephone line (109) as an example. By the inquiry immediately after connection, the exchange recognizes that the terminal was connected and an identification number Request to Send is sent. A multirole key telephone system machine (11) on the other hand, on the basis of control of CPU (125) The terminal identification code (peculiar about a model) memorized fixed in the memory (126) only for read-out is made into a control signal. It sends out to an exchange side through the control signal field (C) of a common bus (123), a shift register (149), and a transmitting frame register (133), a parity addition circuit (135), a NRZ/DP conversion circuit (137), a hybrid circuit (139), and the telephone line (101).

[0106] In an exchange side, if a line card (65) receives this terminal identification code, the number (PN) of the port which received the above-mentioned terminal identification code and this to CPU (37) of a processor through a data highway (233) and I/O (33) by CPU (227) in a line card (15) will be told.

[0107] CPU (37) recognizes it as the multi-function telephone newly having been connected to the above-mentioned port, and sets the data (customer-data etc.) corresponding to the terminal as memory (41) using these two information. Moreover, the identification number for terminal identification (it differs for every terminal) is sent out to a multirole key telephone system (position of Terminal A) through I/O (33), a data highway (233) line card (15), and the telephone line (109) as a control signal.

[0108] In a multirole key telephone system side, if the telephone terminal CPU (125) receives the above-mentioned identification number through a hybrid (139), an DP/NRZ conversion circuit (141), a receiving frame register (143), a shift register (147), and a common bus (123), CPU (125) will accumulate the above-mentioned identification number in rewritable memory (126) (what is necessary is just to constitute from a CE2 PROM). The content of this memory is held even if a telephone terminal carries out a power down. Thereby, the above-mentioned terminal will be in an usable state only by connecting the telephone line.

[0109] The case where a multirole key telephone system in use is moved to other places is explained. The case where the multirole key telephone system connected to the telephone line (109A) is connected and changed to telephone **** (109B) as an example (it moves to the place of Terminal B from the place of Terminal A) is assumed.

[0110] the telephone line (109A) and (109B) — respectively — the terminal number (PN) of the exchange — it shall connect with the port of 1 and 2. If this telephone is removed from a circuit (109A), the exchange will recognize it as telephone having been removed from PN=1 port by the above inquiries. If this telephone is connected to a circuit (109B), the exchange will recognize the child by whom telephone was connected to the port of PN=2 by inquiry. From the exchange, an identification number sending-out demand is sent to the port of PN=2.

[0111] On the other hand, CPU (125) is sent by making into control data the identification number memorized by RAM (126) in telephone at the exchange. In an exchange side, CPU (37) receives the above-mentioned identification number through a line card (15), a data highway (233), and I/O (33). It is recognized as CPU (37) being the multirole key telephone system machine by which the terminal connected to the port of PN=2 from the identification number was connected to the port of former PN=1. Then, the data corresponding to the terminal accumulated in memory (41) are rewritten (customer-data etc.).

[0112] Just as it is, the content memorized as information on PN=1 is moved to the information on PN=2 as it is, and is changed to it. Thereby, after movement becomes usable in the same state as change before only by operation which connects the telephone line. Though natural, how to assign the function of each key is also the same.

[0113] Although the exchange knows that the terminal was connected to a certain port and sends out an identification number sending-out demand by the above inquiries when connecting standard telephones other than a multirole key telephone system etc. to the exchange in this example, since there is no response, the exchange recognizes the above-mentioned terminal to be terminals other than a multirole key telephone system.

[0114] The next port will be asked if the data corresponding to the terminal are already set at this time. If the data corresponding to the terminal are not set, to a maintenance terminal (45), the placing demand of the data corresponding to the terminal (telephone) is sent out, and it becomes the waiting for an input.

[0115] Next, the case where perform new registration of a message and deletion and a change etc. is made by the exchange side is explained. This is performed by I/O processing as processing of the exchange. First, a key in is carried out to "ORG" from a terminal (45). Then, it is displayed as "CODE?" by I/O processing. On the other hand, "0001" is struck from a terminal (45). This is an authorization code for a message input. Then, it is displayed as "MODE?" by I/O processing. this — the input of a message — new registration and change — **** — I/O processing is requiring that it should specify whether it is-izing

[0116] On the other hand, what is necessary is just to carry out the key in of "NEW", "CHG", and the "DEL" from a terminal (45), respectively. What is necessary is just to input the identifier and the message after the key in, according to this, since the inquiry called "MESSAGE?" with "NUMBER?" is carried out.

[0117] Thus, in I/O processing, if new registration of a message, change, deletion, etc. are completed, this purport will be told to a background job, and will suit transform processing, and a message and an identifier (change portion) will be sent to a telephone terminal (11) in between.

[0118] Next, a message transfer when telephone without a display, i.e., standard telephone, is connected to the exchange system in this example is explained. Here, a message shall be changed into voice and it shall transmit to standard telephone. As this whole time composition is shown in drawing 22, the point that the speech synthesis circuit (301) is established in the exchange (13) side is the feature.

[0119] This speech synthesis circuit (301) is equipped with CPU (303), ROM (305) and RAM (307), and I/O (311) as shown in drawing 23. CPU (303) processes according to the program memorized in ROM (305). Moreover, in ROM (305), correspondence with the word dictionary for speech synthesis, the parameter data for rule composition and the above-mentioned identifier, and a message is also memorized.

[0120] Of course, this correspondence is partly considered as the method of setting the content is the above-mentioned, when making RAM which RAM (307) may be made to memorize.

[0121] When the exchange performs a message transfer, the state of a destination terminal has

been acquired from customer data as mentioned above. CPU (37) of the exchange (13) sends an identifier (a variable data may be added further) to the above-mentioned speech synthesis circuit (301) as the destination is standard telephone as a result. This is performed through a data highway (233). CPU (303) will start speech synthesis processing, if an identifier is received through I/O (311) and a common bus (309).

[0122] For example, suppose that "50300" was now sent to CPU (303) as an identifier + variable data. First, the message corresponding to "5" is read from ROM (305) to this. And it changes into the form of "KAIGICHUU 03:00 MADE." It synthesizes voice and changes into the PCM voice data of a 8kHz interval so that this may be described below. The processing flow of speech synthesis is shown in drawing 24. With reference to a word dictionary, reading and an accent are given for every word to the above message data. In this example, reading of "SANJI" is given to "03:00."

[0123] Next, the accent and pause as a clause are given, and talk, and conversion into language is performed. Then, based on a vocal parameter, rule speech synthesis is performed and the PCM data "KAIGICHUU SANJIMADE" of a 8kHz interval are obtained. This data is sent to a line card (15) through a PCM highway (17).

[0124] In a line card, this PCM data is changed into an analog sound signal, and is sent to standard telephone (321), and a message transfer accomplishes it. At this time, you may add the sound and the guidance sentence which show that it is the registered message before a message. Moreover, you may recover message sending out until it places a headset in standard telephone (321).

[0125] As mentioned above, although explained per example of this explanation, this invention is not limited to this example. For example, a line card, a trunk card, etc. may be made to distribute the CPU memory of the exchange etc., a message may be accumulated in the memory of each card, and the transmission system between the exchange and a telephone terminal and a format are not restricted to this invention. In a telephone terminal, CRT, Light Emitting Diode, LCD, and what other displays may be used, and a key array and a key stroke are not restricted to this example, either.

[0126] Even if it makes it message selection, a direct identifier may be chosen, for example with a dial pad etc., and it does not restrict to this method. It is clear that you may not be about a tablet at a data terminal connectable with a telephone terminal, either. Moreover, it is clear that it is not what is restricted to this example also about the example of a message and a control signal code. Moreover, a setup of the identifier to a message is not limited to an example, either.

[0127] In an example, although the message with the high operating frequency in a company was regarded as a fixed message and these were discriminated by the identifier, it is arbitrarily determined in a system to what message an identifier is given. Moreover, as an identifier, a number may be given like an example and a sign may be used. Moreover, you may use the address of memory for an identifier. Moreover, there is not necessarily no need that a message is common about all telephone terminals, and a limit may be imposed on the message which can be used with a telephone terminal.

[0128]

[Effect of the Invention] According to this invention, since an addressee can carry out more suitable correspondence since it is an identifier and an adjustable message and an addressee can be told about a more concrete message, and an identifier is used about the thing of fixation among messages, transmitting on a circuit on the occasion of communication of a message can cut down the amount of transmissions, and therefore, it can aim at shortening of a transmission time.

[0129] For example, in sending the message of "being insulator ***** 3:00 KISHA now", it transmits "3:00" by adjustable message called not an identifier but the character.

[Translation done.]

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TECHNICAL FIELD

[The technical field to which invention belongs] this invention relates to the telephone terminal unit used by the telephone-exchange system which can perform messaging, and this system.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] There are a telephone, facsimile, etc. as communication media supporting an information society. Although such technology is very excellent, it also has a fault. For example, although the telephone had spread most widely and it was convenient equipment, only voice could be transmitted but the limitation was in the service which can be offered considering a system side. This was the same by facsimile. Moreover, there is voice mail to offer the service by the telephone which will seemingly be new. Although this voice mail was excellent in the point that a calling party can transmit information irrespective of the state of a called party, a medium called the voice which the telephone uses was used for it, and it did not pass over it for the usage depending on which telephones differ to be shown, but was inadequate also as service.

[0003] Moreover, the service to which information is made to transmit was able to be considered by sending a message to a partner telephone among these telephones using a thing with a drop, and displaying a message on this drop. However, since the message used here was fixed, while much more amount of information was required of the description, the thing without delay of the transmission time of a message was demanded.

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EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention, since an addressee can carry out more suitable correspondence since it is an identifier and an adjustable message and an addressee can be told about a more concrete message, and an identifier is used about the thing of fixation among messages, transmitting on a circuit on the occasion of communication of a message can cut down the amount of transmissions, and therefore, it can aim at shortening of a transmission time.

[0129] For example, in sending the message of "being insulator ***** 3:00 KISHA now", it transmits "3:00" by adjustable message called not an identifier but the character.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] this invention removes the above fault, can tell a more concrete message, can cut down the amount of transmissions of this message while it can use media other than voice, and the message with which a display is presented by telephone which has spread most widely, and it aims at offering the telephone terminal unit used by the telephone-exchange system which can aim at shortening of a transmission time, and this system.

[Translation done.]

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MEANS

[Means for Solving the Problem] The telephone-exchange system of the first this invention uses a storage means to memorize the identifier prepared corresponding to the fixed message and fixed message of at least 1. In the telephone-exchange system in which message transmission the telephone line between the telephone terminals connected to the swap device boils a part at least, and according to an identifier is possible among telephone terminals a called station An input means to input an adjustable message, and a specific means to specify the identifier corresponding to a fixed message, The first transmitting means which transmits the adjustable message inputted by the input means, and the identifier specified by the specific means, and a swap device The second storage means which memorizes the adjustable message sent by the first storage means which memorizes the message setting situation in a telephone terminal, and the first transmitting means, and an identifier, It has the second transmitting means which transmits the display information for associating and displaying a fixed message and an adjustable message mutually to a call origination terminal among telephone terminals. among telephone terminals a call origination terminal When it has the display means which can display a message, a call is applied from a call origination terminal to a called station and it is judged that the message is set up based on the message setting situation of the first storage means with the swap device It is constituted by associating a fixed message and an adjustable message mutually using display information, and displaying with the display means of a call origination terminal.

[0006] Moreover, when the telephone terminal unit of the first this invention is able to apply a call from other telephone terminals and the message is set up, In the telephone terminal unit used by the telephone-exchange system displayed with the display means of other telephone terminals through the telephone line in the fixed message corresponding to the identifier which can be transmitted at least In order to associate and display the fixed message and adjustable message corresponding to an identifier mutually with an input means to input an adjustable message, a specific means to specify the identifier corresponding to a fixed message, and the display means of other telephone terminals It is constituted by having a transmitting means to associate mutually the adjustable message inputted by the identifier specified with the specific means, and the input means, and to transmit.

[0007] When the telephone terminal unit of the second this invention applies a call to other telephone terminals with which the identifier corresponding to the fixed message which can be transmitted is specified through the telephone line, In the telephone terminal unit used by the telephone-exchange system by which a fixed message is displayed at least with the display means of self by the identifier sent from other telephone terminals When the adjustable message is inputted at other telephone terminals, it is constituted by having a display means to associate and display the fixed message and adjustable message corresponding to an identifier mutually with a display means.

[0008] The telephone-exchange system of the second this invention contains two or more telephone terminals which have a display means and a storage means to memorize a correspondence relation with the identifier which discriminates a fixed message and a fixed message. It is the telephone-exchange system which performs messaging. a dispatch telephone

terminal A transmitting means to transmit the message information which consists of an input means by which an adjustable message can be inputted, and an identifier and an adjustable message, following the identifier corresponding to a fixed message, and a received telephone terminal. It is constituted by having a receiving means to receive message information, and the control means which read a fixed message from a storage means based on an identifier among message information, associate a fixed message and the adjustable message of message information mutually, and are displayed with a display means.

[0009] A storage means to memorize a correspondence relation with the identifier from which the telephone terminal unit of the third this invention discriminates a fixed message and a fixed message, A receiving means to receive an identifier and an adjustable message, and a display means to display any 1 at least among a fixed message and an adjustable message, The fixed message corresponding to the identifier which receives with a receiving means is read, and it is constituted by having the control means which associate a fixed message and the adjustable message of message information mutually, and are displayed with a display means.

[0010]

[Embodiments of the Invention] Next, the example of this invention is explained according to a drawing.

[0011] The system concerning this example is shown in drawing 2. This system consists of the telephone terminal (hereafter, when calling it a telephone terminal, it considers as this type of thing in principle.) (11) equipped with the display, and an exchange system (13). In this system, if the input directions of the message are carried out in the telephone terminal (11) of 1, a transfer indication of the message will be given to other telephone terminals (11). It is the case of the call origination from other telephone terminals (11) to the telephone terminal (11) of 1 that a message is transmitted, when it is sending out of the direct message to other telephone terminals [terminal / (11) / telephone / of 1] (11). As later mentioned about a transfer of a message, the point using an identifier is one feature of this invention.

[0012] Next, the system is explained in full detail. First, the exchange system (13) contains the line card (15) which leads a telephone terminal (11) to an exchange system (13), as shown in drawing 2. Between the line card (15) and the telephone terminal (11), it connects by two-wire system bidirectional burst transmission (ping-pong transmission) so that it may mention later. In addition, the electric power supply line is omitted in drawing 2. To the same line card (15), the telephone terminal (11) of plurality (2-4 pieces) is connected. From the line card (15), the PCM highway (17) is prolonged in the time switch circuit (19).

[0013] Not only a line card (15) but a trunk card (21), a tone circuit (23), and a meeting circuit (25) are connected to this time switch circuit (19) through a PCM highway (27), (29), and (31). The sound signal or the data signal has ridden on the PCM highway.

[0014] A time switch circuit (19) makes a change of the time slot about the signal of a PCM highway (17), (27), (29), and (31) etc.

[0015] A trunk card (21) is a card to which a main wire, a dedicated line, etc. are connected.

[0016] A tone circuit (23) sends out various tones to a telephone terminal (11) and a main wire. Various tones are supplied from this circuit (23) as a digital signal.

[0017] A meeting circuit (25) performs the operation in the case of performing a telephone call of three or more persons.

[0018] In addition, a reference clock is supplied to a line card (15), a time switch circuit (19), a trunk card (21), a tone circuit (23), and a meeting circuit (25) from a clock generation machine (26), and operation is specified in them. The control line of a couple is connected to the line card (15), the trunk card (21), the tone circuit (23), and the meeting circuit (25). The other end of the control line is connected to I/O (33).

[0019] The common bus (35) is prepared to I/O (33), and CPU (37), a floppy disk (FD), (39), memory (41), and the I/O circuit (43) are hanging down from this common bus (35).

[0020] The program of exchange control action and various data are memorized by the floppy disk (39). The contents of storage of a floppy disk (39) are loaded to memory (41), and CPU (37) operates according to the contents of storage in memory (41). The floppy disk (39) is used as an object for backup of memory (41).

[0021] The data terminal (45) is connected to the I/O circuit (43). A data terminal (45) is used for a customer entry of data and maintenance control which are mentioned later. Customer data are attribute information, such as functional assignment of a key, by the classification of a telephone terminal, the telephone number, and each functional telephone. Moreover, in this example, a message is also inputted from this data terminal (45).

[0022] Next, the transmission system between a telephone terminal (11) and a line card (15) is explained.

[0023] As mentioned above, in this example, a two-wire bidirectional burst transmission method is used. By this method, the signal is sent and received like ping-pong between a telephone terminal (11) and an exchange system machine (line card (15)). As shown in drawing 3, the signal of a predetermined format is transmitted to a telephone terminal (11) in the shape of a burst from a line card (15). On the other hand, a signal is transmitted to a line card (15) in the shape of a burst from a telephone terminal (11). This is performed in 125microsec.

[0024] Next, the signal format in this transmission system is explained. As shown in drawing 4, one frame is formed by 12 bits. 1 bit [of a head] a frame synchronization bit (F) and the following 8 bits (V) are assigned to a sound signal. Then, 1 bit (D) is assigned to data, 1 bit (C) is assigned to a control signal, and 1 bit of the last is an object for parity (P).

[0025] If only a sound signal is seen, 8 bits will be transmitted for every 125microsec, and 64kbpsPCM real-time transmission will be realized. A data terminal etc. is connected to a telephone terminal (11), and data (D) are used when also performing data transmission simultaneously using the telephone line. What is necessary is just to use the bit for sound signals (V), when not performing voice transmission.

[0026] Usually, a control signal bit (C) is a signal for control of a telephone terminal (11), and constitutes one unit by 12 bits. That is, the control signal shown in drawing 5 is obtained by receiving the signal of the format shown in drawing 4 12 times, and accumulating 12 control-bit C (12 multi-framing composition). With this, conversely, transmission is divided into each bit and should just transmit. Parity (P) is a bit for a parity check.

[0027] as mentioned above, a telephone terminal (11) and a line card (15) — although, as for a transmission system in the meantime, two-wire bidirectional burst transmission (ping-pong transmission) is adopted, as for each signal, the phase coding is given on the transmission line. The phase coding is coding from which level changes synchronizing with a clock, the signal level is fixed in the same clock section, and the signal level moreover changes to "0" to "1" in the same clock section.

[0028] The example as which DP signal train is specified to an NRZ signal train is shown in drawing 6 (a) and (b). In addition, it only means that a duty ratio expresses an NRZ signal here at 100% to data. Therefore, what is necessary is just to consider an NRZ signal train as digital data in a telephone terminal (11) and a line card (15) here. In addition, about required hardware composition, it mentions later.

[0029] Next, a telephone terminal (11) is explained further in full detail. The appearance of a telephone terminal (11) here is the feature that the point equipped with LCD (51) as shown in drawing 7 is big. Softkey (53) **** (63) is prepared in the bottom of this LCD (51). One softkey (65) is prepared out of LCD (51). The function of this softkey (53) **** (65) is assigned according to the state of a terminal. The name of the function assigned by the state of a terminal is displayed on the portion corresponding to softkey (53) **** (63) in LCD (51).

[0030] Function key (67) **** (79) other than this softkey (53) **** (65) is prepared. Various functions are programmably assigned to this function key (67) **** (79). Light Emitting Diode (81) **** (93) which shows the state of (67) **** (79) of this key is prepared in the right-hand side of this key (67) **** (79).

[0031] Furthermore, function key (95) **** (101) other than function key (67) **** (79) is prepared. Function key (67) **** (79) and (95) **** (101) are not the things of the property which functions, such as a fixed function, for example, auto dialing etc., are assigned fixed, and is assigned according to the state of a terminal.

[0032] The dial pad (102) is prepared in the case up center section of the telephone terminal (11).

[0033] Moreover, the headset (105) is prepared for the loudspeaker (103) in case up left-hand side. This headset (105) is connected to the case through the codec (107). Such a telephone terminal (11) is connected with the exchange (line card (15)) through the telephone line (102).

[0034] Next, the electronic composition of a telephone terminal (11) is explained according to drawing 8. Here, a data terminal (111) is connected to a telephone terminal (11), and an example equipped with a drawing phone tablet input unit (113) is explained.

[0035] This terminal (11) consists of a ping-pong transmission system (115), a voice system (117), an operation system (119), and a processor (121). A ping-pong transmission system (115) sends and receives a signal between the telephone lines (109), exchanges voice data with a voice system (117) further, and considers digital data as an exchange with a processor (121) and a data terminal (111). A voice system (117) performs conversion with a digital signal and voice. An operation system (119) can be considered as a man machine interface of an operation table and a processor (121). A processor (121) controls operation of the whole terminal (11) while performing fixed processing to data.

[0036] A voice system (117) contains a headset (105) and a loudspeaker (103). This voice system (117) is control and the timing signal T2 of CPU (125) in a processor (121). (it mentions later) The PCM voice data from a ping-pong transmission system (115) is changed into an analog sound signal with a codec & filter (127) under control. This analog sound signal is sent to a headset (105) or a loudspeaker (loudspeaker) through a buffer amplifying circuit (129), and serves as audible sound. A codec (codec) is the thing equipped with both the functions of an encoder (coder) and ***** (decoder), and is PCM sign *****. Control of CPU (125) to this codec & filter (127) is performed through I/O (131) for common path (123) voice.

[0037] The analog sound signal sent from a headset (105) is sent to the transmitting frame register (133) of a ping-pong transmission system (115) through a codec & filter (127). The output of a transmitting frame register (133) is sent to a parity addition circuit (135). The output of a parity addition circuit (135) is sent to a NRZ/DP conversion circuit (137), and is sent out through a hybrid (139) to the telephone line (109).

[0038] The above is a transmitting portion among ping-pong transmission systems (115).

[0039] On the other hand, at the time of reception, the output from a hybrid circuit (139) is supplied to an DP/NRZ conversion circuit (141). The output of an DP/NRZ conversion circuit (141) is sent to a receiving frame register (143). A receiving frame register (143) has each field the object for sound signals (V), the object for data (D), and for control signals (C).

[0040] They are 8 bits of each number of bits, 1 bit, and 1 bit. The data of the field for sound signals (V) serve as an input of a codec & filter (127) among receiving frame registers (143). Similarly the data of the field for data (D) are sent to a data terminal (111) through I/O (RS232C) (145). The data of the field for control signals (C) are sent to 12 bit-shift register (SR) and (147).

[0041] A transmitting frame register (133) is also the same composition, and consists of the 8 bits field for sound signals (V), the 1 bit field for data (D), and the 1-bit field for control signals (C). The output of the above-mentioned codec & filter (127) is inputted into the field for sound signals (V) of a transmitting frame register (133). The data from a data terminal (111) input into the field for data (D) through I/O (145). The output from 12 bit-shift register (149) inputs into the field for control signals (C). 12 bit-shift register (147) and (149) are connected with the common bus (123).

[0042] Next, operation is explained. The 8-bit PCM sound signal from a codec & filter (127) is once memorized to the field for (sound signals V) in a transmitting frame register (133).

[0043] On the other hand, from CPU (125), control data is sent per 12 bits and is once memorized by 12 bit-shift register (149) through a common bus (123). The every 1 bit data from this 12 bit-shift register (149) are memorized to the field for control signals (C). Data sending out from 12 bit-shift register (149) is 1 time of a rate at 125microsec. This is controlled by the timing signal T1. Data sending out from I/O (145) the data from a data terminal (111) are remembered to be to the field for data (D) through I/O (145) is also a timing signal T1. It is controlled. Thus, if 10-bit data are prepared, in a parity addition circuit (135), a frame synchronization bit (F) and 1 bit (P) of parity bits will be added, respectively. This format is th

same as the format shown in drawing 4. This data is outputted in the form of 100% of duty ratios. This serves as an NRZ (Non-Return-To Zero) signal and a highly uniform. This signal train is NRZ. The phase coding is given by DP conversion circuit (137). Then, it is sent out through a hybrid circuit (139) to the telephone line (109).

[0044] At the time of reception, the signal with which the phase coding was given is changed into an NRZ signal train from a hybrid circuit (139) in an DP/NRZ conversion circuit (141).

[0045] This signal is a 12-bit unit, a frame synchronization bit (F) parity bit (P) is excepted, and data of the 9th bit of the 2-bit **** are memorized from a head to the field for sound signals (V). Then, the 10th bit is memorized to the field for data (D), and the 11th bit is memorized to the field for control signals (C). The data of the field for sound signals are inputted into a codec & filter (127), and are changed into audible sound as mentioned above.

[0046] The data of the field for data are sent to a data terminal (111) through I/O (145). The data of the field for control signals are sent to 12 bit-shift register (147), and if 12 bits is accumulated, they will be sent to CPU (125) through a common bus (123).

[0047] An operation system (119) contains the LCD controller (151) which carries out drive control of the LCD (51). The key input information from a dial pad (102), softkey (53) **** (65), function key (67) **** (79), and (95) **** (101) is told through an I/O (153) common bus (123) to CPU (125). Moreover, CPU (125) which acquired information about the operation state of function key (67) **** (79) gives an instruction so that predetermined Light Emitting Diode (81) **** (93) may be displayed on a Light Emitting Diode drive system (155) while performing predetermined processing.

[0048] CPU (125) performs predetermined processing according to the program memorized by ROM (157). Moreover, a data terminal (111) exchanges data through I/O (145) and I/O (159). The input configuration information from a drawing phone tablet input unit (113) is told through I/O (159) to CPU (125).

[0049] Next, the concrete composition of a NRZ/DP conversion circuit (137), a high Brit circuit (139), and an DP/NRZ conversion circuit (141) is explained according to drawing 9.

[0050] These circuits (137), (139), and (141) are electrically connected with the telephone line (109) through a high Brit coil (161). And it consists of the transmitting section (163) centering on a NRZ/DP conversion circuit (137); and the receive section (165) centering on an DP/NRZ conversion circuit (141).

[0051] The signal from the telephone line (109) is acquired as digital data by such composition, the phase coding is given and digital data is sent out to the telephone line (109).

[0052] Next, the clock of a telephone terminal (11) of operation is explained. In this example, clocks of operation have been obtained from the frame detector (167) and timing-control circuit (169) which are shown in drawing 8. That is, a frame synchronization bit is detected from the signal received in the frame detector (167), and a clock signal is generated synchronizing with this detection timing. This responds to the above-mentioned frame detection from the clock signal from the clock generation machine (prepared between timing generating circuits (169)) which is not illustrated, and is a timing signal T1. -T4 It generates.

[0053] Timing signal T1 8kHz, timing signal T2 64kHz, timing signal T3 256kHz, timing signal T4 It is a 2MHz clock signal. Moreover, since data are written in from a codec & filter (127), I/O (145), and 12 bit-shift register (149) and data are read to a parity addition circuit (135) to a transmitting frame register (133) as mentioned above, naturally it is necessary to shift a phase about this writing and read-out. The same is said of a receiving frame register (143).

[0054] Next, a line card (15) is explained according to drawing 10. This line card (15) is equipped with a hybrid circuit (201), a transceiver circuit (203), and a receiving frame register (205). The composition of a hybrid circuit (201) and a transceiver circuit (203) is the same as the concrete composition shown in drawing 9. That is, coding of the signal of the telephone line (109) is solved, it changes into an NRZ signal, and an NRZ signal is conversely changed into a die phase signal (DP signal). You may consider an NRZ signal to be digital data identically here. In a synchronizing signal detector (204), the signal with which the die phase signal was solved detects a frame synchronization bit (F), and loads an NRZ signal to a receiving frame register (205) based on this signal.

[0055] At this time, the data of a 2-bit **** 9 bit view are memorized from a head (it counts from a frame synchronization bit (F)) to the field for sound signals. The bit [10th] data are memorized to the field for data. The bit [11th] data are memorized to the field for control signals. Next, the data of the field for sound signals and the field for data are transmitted to a register (207) and (209). Multi-PUREKUTA (213), a counter (215), and a comparator (217) are formed to this register (207) and (209). A register (207) and (209) send out storing data to a multiplexer based on a clock signal. This clock signal is supplied through the clock signal line (219) from the clock generation machine (26) shown in drawing 2. This clock signal is supplied also to a counter (215), and counting is carried out in a counter (215). A counter (215) is initialized by the frame synchronization signal of PCM. This PCM frame synchronization signal is sent from I/O (33) through a frame signal line (221).

[0056] What is necessary is just to think that it is prepared together as a PCM highway (17) etc. by drawing 2, although omitted. Therefore, the counter (215) carries out counting of the clock signal from the head of the frame of PCM, and coincidence detection with the value defined beforehand is performed in a comparator (217). This value defined beforehand is the peculiar address defined for every line card, and is also the number of the time slot assigned to each line card (or telephone terminal (11)) so that it might mention later.

[0057] in addition — the case where two or more telephone terminals (11) are set up to the line card (15) — in this way — a comparator (217) — setting — the peculiar address and counting — if the number of clock signals is in agreement, a multiplexer (213) and the demultiplexer (223) mentioned later will be told about this result. In response, a multiplexer (213) multiplexes a register (207) and the content of (209), and sends them out to a PCM highway (17). This PCM highway (17) is connected to the time switch circuit (19) as mentioned above.

[0058] On the other hand, the control signal memorized to the field for control signals of a receiving frame register (205) is accumulated at 12 bit-shift register (211). If accumulated by 12 bits, it will be sent to CPU (227) through a bus (225) as one control signal.

[0059] If CPU (227) is decoded by fixed processing and has the need according to the contents of storage of memory (229), it sends out the contents to a data highway (233) through I/O (231). The data sent out to the data highway (233) are sent to CPU (37), and predetermined processing is performed.

[0060] Although the above is transmission from a telephone terminal (11) to an exchange side, transmission to a telephone terminal (11) from an exchange side is explained below. Time Division Multiplexing of the PCM voice data sent through a PCM highway (17) is carried out. This data is incorporated in a line card (15) in a demultiplexer (223). As mentioned above, the peculiar address is assigned and each line card (15) also has a number of the time slot by which this was assigned to each line card (15). As mentioned above, with a comparator (217), when coincidence with the clock value which carried out counting, and the peculiar address is obtained and it is in agreement from the start of the frame of PCM, a demultiplexer (223) is also told about this result. In a demultiplexer (223), in response, a receiving PCM signal is divided into voice and data, and it transmits to a register (235) respectively (237). A register (235) and (237) operate in response to supply of a clock signal from a clock signal line (219).

[0061] The data sent through a data highway (233) are data required for exchange control, and are distinguished from the data transmitted through the above-mentioned PCM highway (17). The data sent through a data highway (23) are sent to CPU (227) through I/O (231), and are accumulated further at a register (239). Next, the contents of a register (235), (237), and (239) are transmitted to a transmitting frame register (241). This transmitting frame register (241) is divided into three fields, and that of ***** is the same as a receiving frame register (205) or the receiving frame register (133) in a telephone terminal (11).

[0062] The content of this transmitting frame register (241) is sent to a transceiver circuit (203). In this circuit (203), the phase coding is given and data are sent out to the telephone line (109) through a hybrid circuit (201). Next, messaging is explained. In this example, a message is separated as a fixed portion and a variable part, and the identifier is expressing the form. Furthermore, in this example, one feature is in the point that the above-mentioned identifier mainly performs messaging. Correspondence with an identifier and the fixed portion (it is called a

fixed message below) of a message is set up as shown in Table 1 (it is called an identifier table below).

[0063]

[Table 1]

識別子	固定メッセージの内容
1	ガイシユツ
2	ガイシユツ _____ キンヤ
3	キュウカ
4	シユツチヨウチユウ _____ シユツジャ
5	カイギチユウ _____ マデ
6	オキヤクサンデス ヒシヨ
⋮	
n	_____ ヘテソワシテクダサイ

The portion to which the underline was given is a variable part of a message among the fixed message of Table 1. Thus, having divided the message into the fixed portion and the variable part notes that the required message is patternized in everyday life and business.

[0064] A variable part is not necessarily surely required. The maintenance storage of the correspondence of this identifier-fixed message is carried out at least at all the display affair telephone terminals (11). There are two kinds in the method of this storage.

[0065] One is the case where it memorizes to ROM, and another is the case where it memorizes to RAM. The first example explains the example which made ROM memorize the above-mentioned correspondence.

[0066] Since ROM is the memory only for read-out, it needs to make the above-mentioned correspondence memorize beforehand, and it is necessary to equip each terminal (11) with it. In this case, although it is not necessarily required in an exchange side to have this correspondence beforehand, the same content of storage as ROM in a terminal (11) is stored in memory (41) or a floppy disk (39) here. About an initial input, it mentions later.

[0067] Next, messaging is explained. There are two kinds of modes in messaging in this example. It considers as message setting demand mode, and is message sending-out demand mode. The telephone terminal (11) operator itself is an absence etc., message setting demand mode sets up the message beforehand, when a telephone (11) cannot be answered after this, and from the terminal (11) of **, when call origination is carried out, it transmits the above-mentioned message to this calling party.

[0068] Message sending-out mode sends out a message to the calling party-ed, when call origination is carried out to other terminals (11) and a calling party-ed does not answer.

[0069] First, message setting demand mode is explained. In order to perform this mode, the key (65) of a telephone terminal (11) is operated first. This key (65) is message setup / selection key. If this key (65) is pushed at first, CPU (125) of a telephone terminal will make this operation state detection people and message setting mode. In this mode, CPU (125) calls the contents of an identifier "1" from an identifier table, and displays them on LCD (51). Here, "guy SHUTSU and the vest" corresponding to an identifier "1" are displayed. Since this is not a now required message, an operator pushes message setup / selection key (65). Then, the contents of an identifier "2" are displayed. If the same operation as the following is repeated and the contents

of an identifier "5" are displayed, an operator will push a check key. As a check key, the inside of a dial pad (102) may be used, and one may be suitably chosen and set up from function key (67) - (79), (95) - (101) inside. Moreover, you may assign a function to one of the softkey (53) **** (63). A setup of a fixed message was completed now.

[0070] Next, an adjustable message "03:00" is inputted. This pushes a dial pad (102) with "0", "3", "0", and "0." CPU (125) is displayed on the field to which the underline in the message currently displayed on LCD (51) was given in this "0", "3", "0", and "0" as 03:00. Then, it is displayed as "KAIGICHUU 03:00 MADE." At this time, CPU (125) memorizes the identifier "5" and the adjustable message "0300" as "50300" to RAM (156). Simultaneously, this "50300" is sent out as data to the exchange.

[0071] This is explained in more detail. Sending out of this data is performed like sending out of the control signal of a telephone terminal (11). In this example, since the ping pong transmission system is adopted, the bit for control signals under format shown in drawing 4 will be used. Moreover, the data itself used here consider as one unit by 12 bits. First, CPU (125) sends a message setting demand to the exchange. An example of this setting demand is shown in drawing 14. It is C0 although it is one unit in 12 bits here. The bit for frame synchronization, C1 C2 The bit which shows the meaning which this 12-bit data expresses, and the data C11 which C3-C10 send out are the bits for parity checks (this example even number).

[0072] Such 12-bit data are sent out to 12 bit-shift register (149) (shown in drawing 8) from CPU (125), and it is sent out to the exchange by the above-mentioned procedure. Then, the identifier number of a message, variable data (time in a message, days and months, etc.), and a message setting end are sent out. In an exchange side, a line card (15) receives and the above data are sent to CPU (37).

[0073] After CPU (37) receives and recognizes a message setting demand, it recognizes the identification number of a message, and a variable data, and memorizes them to the message registration field of memory (41). The composition of the message registration field of this memory (41) is explained. It constitutes from port correspondence and a message registration field consists of this example also in consideration of customer data.

[0074] This example is shown in drawing 12.

[0075] A port points out the output terminal for example, by the side of the terminal (11) of the line card (15) of drawing 2. What is necessary is just to use the number which added 2 bits to the above-mentioned peculiar address here, when calling it a port number. Customer data are attributes, such as functional assignment of the classification of a telephone terminal (11), a state, the telephone number, and a key. As a classification of a terminal (11), they are the usual dial telephone, a push-button phone, a telephone with a display, a telephone with a data terminal (for example, computer phone), etc. The state of a telephone terminal (11) is the concept of level of being used with a state transition diagram, and as shown in drawing 13 and Table 2, it is in the state of the terminal (11) seen from the standpoint of exchange control. In this example, the feature is in the point of having established the state of calling it "under a message set" as a state "7."

[0076]

[Table 2]

0	空 き	4	通話中
1	ダイヤルトーン	5	リジートン
2	ダイヤル受信	6	規制中
3	相手呼出中	7	メッセージセット中

A message is memorized during a set to such customer data dealing with a port. A message consists of the fixed-data section and the variable-data section which consist of an identifier

during this set. Here, they are an identifier "5" and the variable-data section "0300."

[0077] Thus, when the inside of the exchange is set up, suppose that call origination was carried out to the message sending-out terminal (11) from terminals (11) other than the terminal (11) which sent out the message. CPU in the exchange (37) receives the call origination from a terminal (11), and searches the customer data dealing with a port. This search investigates the state of a call origination-ed terminal. Although a line connection will be performed if it is a state "0", a terminal "5" is a state "7" here and, as for CPU (37), it recognizes that it is [message] under setup.

[0078] Then, a message is called during a set and the data "50300" are sent out as control data to a call origination terminal. The sending-out procedure at this time is the same as the sending-out procedure from the terminal at the time of a message setup (11) to the exchange, and CPU in the exchange (37) sends the above-mentioned control data to a call origination terminal through a line card (15) etc. by the format shown in drawing 14. Between the line card (15) and the telephone terminal (11), the ping pong transmission system is used as mentioned above.

[0079] In CPU (125) of the terminal which received the message transfer, after recognizing control data, the contents of an identifier table are called from memory (157) using an identifier. Here, it corresponds to "5". "KAIGICHUU : MADE" will be called. However, it is "KAIGICHUU" in case an identifier table is made to memorize. : it is also good to memorize the character corresponding to MADE" as it is, to prepare a character generator independently and to memorize character code.

[0080] Next, CPU (125) displays the fixed message and variable data which were called on LCD (57). Thus, to it, it means that the display "KAIGICHUU 03:00 MADE" accomplishes to a call origination terminal, and the transfer of a message and the display had accomplished. You may make it display the number of a call origination-ed terminal, a call origination-ed terminal-handling person, etc. simultaneously with such a display.

[0081] Next, message sending-out demand mode is explained. This is the required mode to contact urgently even while a call origination-ed terminal is talking over the telephone. For example, it is a time of a secretary wanting to contact a superior official urgently and to tell a visitor. In such a case, to a call origination terminal, a busy tone is sent out from the tone circuit (23) of the exchange. If such a busy tone is received, CPU (125) of a telephone terminal (11) will assign each function of a camp-on, automatic call return, a re-call, a message transfer, and interruption to key (53) - (63). Simultaneously, CPO (camp-on), ACB (automatic call return), RCL (re-call), LMG (message transfer), and OUR (interruption) are displayed on the portion corresponding to key [in LCD (51)] (53) - (63).

[0082] Next, an operator pushes a key (59). In this state, this softkey (59) is a message transfer key, and will transmit the message created by the following processings to the call-ed point by pushing this key (59).

[0083] First, a setup of a message is displayed to CPU (125). And like the above-mentioned message setting demand mode, an identifier table is called and it is displayed from the contents of an identifier "1." And the fixed portion of a message is decided by operation of a key (65) and a dial pad (102). Here, an identifier "6" shall be chosen. In this example, a message is first sent out to the exchange according to the procedure and format which are unnecessary as for a variable data and are shown in drawing 15. In CPU (37) of the exchange, recognition of a message sending-out demand sends out the data of the format shown in drawing 15 to ****- d as control data of a terminal (11) as it is.

[0084] By doing in this way, even if a called station is talking over the telephone (again what state), since a message can be transmitted and moreover uses an identifier, it can also cut down the amount of transfers sharply. Although the above-mentioned example explained the example which makes ROM memorize an identifier table, naturally RAM (Random Access Memory) can also be made to memorize. And it has the effect it is ineffective to it being clear from the following explanation in this case.

[0085] In the explanation shown below, in an initial state, correspondence of an identifier - message shall not be memorized by each telephone terminal (11) at the same time it inputs correspondence of an identifier - message into the floppy disk in the exchange (39) from a data

terminal (45). Hardware-composition presupposes that it is the same as that of the above-mentioned example.

[0086] First, the correspondence-related input of the identifier-message to floppy DIKUSU (39) is explained. A data terminal (45) is a terminal for maintenance, and when writing in a message from this terminal (45), it inputs an authorization code. For example, when an authorization code is "0003", the following processings are diagnoses, and when it is "0002", it decides like the writing of a message at the set of customer data, and the time of "0001." Here, if an authorization code "0001" is inputted, CPU (37) will recognize it as the data after this being an identifier number and a message (fixation). Therefore, these contents are memorized into the portion which consisted of RAM of a floppy disk (39) or memory (41). These contents of storage are not limited to the 1st table.

[0087] Thus, if correspondence with an identifier number and a message is determined, processing which transmits these contents of storage to each telephone terminal (11) will be performed. But there is no direct relation with when the information about the message in the exchange is prepared, as for the concept of a transfer. That is, naturally within the exchange, the above-mentioned contents may be accumulated to ROM.

[0088] Now, as for a transfer of the above-mentioned contents of storage (correspondence with an identifier number and a message), it is desirable at the time of power supply starting of the exchange to carry out at the time of change of a message and new matter addition etc. at the time of a new terminal connection. First, the transfer at the time of power supply starting is explained. When the power supply of the exchange is switched on, the exchange program memorized by the floppy disk (39) and required data (the data about the above-mentioned message may also be included) are loaded, and memory (41) is made to memorize, as shown in drawing 16. Next, the initial program mentioned later considers as a start, and I/O processing, the message exchange, background processing, error processing, etc. are performed by the supervisor after completing processing by this program according to priority.

[0089] Next, an initial program is explained.

[0090] This program is first started from processing in which initialization of the whole hardware, especially the memory of a data area are cleared, as shown in drawing 17.

[0091] This is because the contents of the initial state of a data area are not guaranteed only in an exchange program and loading of required data. A data area is a data-storage field about mounting states, such as a line card shown below, and memory is initialized in advance of the right data storage by the above-mentioned clearance.

[0092] Next, mounting states, such as a line card (15) and a trunk card (21), are checked. For this reason, it asks from CPU (37) and a signal is sent out to a line card (15) and a trunk card (21) using a control signal line (data highway). On the other hand, CPUs (227), such as each line card (15), return answer of being mounted to CPU (37). This answer should just use what omitted 2 bits of low ranks of the peculiar address which should just use the peculiar number given to each line card (15), and which are used as a reference value of the comparator (217) shown in a view 10 as a peculiar number.

[0093] Originally this peculiar address is set up to a telephone terminal (11) and a (port) here having thrown away 2 bits of low ranks. In this example A line card (15) is discriminated by writing that four terminals (11) connect with one line card (15) by things other than 2 bits of low ranks of the peculiar address, it includes to 2 bits of low ranks, and even the telephone terminal (21) is discriminated. Since expression of the peculiar address will also change if the number of terminals (11) connected to a line card (15) naturally changes, expression of a peculiar number here also changes. When CPU (37) receives such a response, mounting of a line card (15) etc. is checked.

[0094] By this, CPU (37) obtains the map about mounting of a card. Next, the check of the connection state of a telephone terminal (11) is explained.

[0095] CPU (37) of the exchange is sent out to each terminal (11) by making an inquiry signal into a control signal. The format of the inquiry signal in this example of following drawing 5 is natural. On the other hand, CPU (125) of a telephone terminal (11) is sent out to the exchange, for example by considering a specific number as an answer, if an inquiry signal is received.

(About this, it mentions later further.)

CPU (37) builds the map about the mounting state of a terminal (11) in response to this response. An example of the response to an inquiry signal and this is shown in drawing 18. Thus, the mounting state about a card (15) and a terminal (11) is checked, and CPU (37) can complete a mounting map.

[0096] Next, CPU (37) initializes a telephone terminal (11). By this initialization, transmission and reception of a telephone terminal (11) are attained. Then, CPU (37) is read from a floppy disk (39), reads the data about the message memorized by memory (41), and sends them to a terminal (11).

[0097] This data transfer is performed as a transfer of the control data to a terminal (11). The data format at this time is shown in drawing 20.

[0098] CPU in the exchange (37) emits first the message storage demand instruction which consists of 12 bits. It is received by CPU (227) in a line card (15), and this is once accumulated at a register (239). Then, it is sent to a terminal (11) through the telephone line (109) using the bit for control signals under ping-pong transmission format. At a terminal (11), it is sent to CPU (125) through a receiving frame register (143), 12 bit-shift register (147), etc.

[0099] By such procedure, the above-mentioned message storage demand, the identifier number of a message, and a message are sent to a terminal (11) one after another. CPU (125) of a terminal (11) memorizes the identifier and the message in RAM (156). And this processing will be terminated if a message storage end instruction is received.

[0100] In this way, CPU (125) of a telephone terminal (11) accumulates the sent data to RAM (156). By this, the exchange and a telephone terminal (11) will completely hold the same identifier and the same message. An initial program is ended now and an exchange program usually starts.

[0101] CPU (37) is updating the mounting map the fixed period in principle using the idle time of the message exchange. That is, connection of a new terminal (11) is performed and a change (change of a connection port) of the connecting location of a terminal (11) etc. is made. If this is obtained by port correspondence, it will call it automatic change of customer data. When especially a new terminal (11) is connected to the system which the exchange governs and change of customer data originates, an identifier and a message are transmitted to the new terminal (11) concerned like the above-mentioned initial program. At a new terminal (11), the transmitted data will be accumulated to RAM and the exchange and the same data as the terminal (11) of ** will be held.

[0102] Here, the check of whether the terminal (11) is connected is explained in detail. The exchange is performing the inquiry for confirming whether the terminal is connected or it does not connect to each port the fixed period. To this inquiry, when a terminal answers, the exchange recognizes that the terminal is connected to the port.

[0103] It asked drawing 21 and the flow chart showed operation of the exchange at the time. At the time of usual (except [the time of connecting a terminal, and when a terminal is extracted]), the exchange is asking one by one to each port. When a terminal is connected to the exchange and it sees from the exchange, a response will come on the contrary suddenly from the port which did not have a response till then. In this case, if the exchange repeats an inquiry 3 times in the same port and has a response to all, it will recognize it as the terminal having been connected to the point of the above-mentioned port.

[0104] When a terminal is extracted from the exchange (the terminal was cut) and it sees from the exchange, a response stops on the contrary, returning suddenly from the port to which the normal response was returned till then. In this case, if the exchange sends out an inquiry 3 times in succession and there is no response to all to the same port, it will recognize it as the terminal connected to the above-mentioned port having been extracted.

[0105] The case where a multirole key telephone system is newly connected to the exchange is explained. A multirole button shall be connected to the telephone line (109) as an example. By the inquiry immediately after connection, the exchange recognizes that the terminal was connected and an identification number Request to Send is sent. A multirole key telephone system machine (11) on the other hand, on the basis of control of CPU (125) The terminal

identification code (peculiar about a model) memorized fixed in the memory (126) only for read-out is made into a control signal. It sends out to an exchange side through the control signal field (C) of a common bus (123), a shift register (149), and a transmitting frame register (133), a parity addition circuit (135), a NRZ/DP conversion circuit (137), a hybrid circuit (139), and the telephone line (101).

[0106] In an exchange side, if a line card (65) receives this terminal identification code, the number (PN) of the port which received the above-mentioned terminal identification code and this to CPU (37) of a processor through a data highway (233) and I/O (33) by CPU (227) in a line card (15) will be told.

[0107] CPU (37) recognizes it as the multi-function telephone newly having been connected to the above-mentioned port, and sets the data (customer-data etc.) corresponding to the terminal as memory (41) using these two information. Moreover, the identification number for terminal identification (it differs for every terminal) is sent out to a multirole key telephone system (position of Terminal A) through I/O (33), a data highway (233) line card (15), and the telephone line (109) as a control signal.

[0108] In a multirole key telephone system side, if the telephone terminal CPU (125) receives the above-mentioned identification number through a hybrid (139), an DP/NRZ conversion circuit (141), a receiving frame register (143), a shift register (147), and a common bus (123), CPU (125) will accumulate the above-mentioned identification number in rewritable memory (126) (what is necessary is just to constitute from a CE2 PROM). The contents of this memory are held even if a telephone terminal carries out a power down. Thereby, the above-mentioned terminal will be in an usable state only by connecting the telephone line.

[0109] The case where a multirole key telephone system in use is moved to other places is explained. The case where the multirole key telephone system connected to the telephone line (109A) is connected and changed to telephone **** (109B) as an example (it moves to the place of Terminal B from the place of Terminal A) is assumed.

[0110] the telephone line (109A) and (109B) -- respectively -- the terminal number (PN) of the exchange -- it shall connect with the port of 1 and 2. If this telephone is removed from a circuit (109A), the exchange will recognize it as telephone having been removed from PN=1 port by the above inquiries. If this telephone is connected to a circuit (109B), the exchange will recognize the child by whom telephone was connected to the port of PN=2 by inquiry. From the exchange, an identification number sending-out demand is sent to the port of PN=2.

[0111] On the other hand, CPU (125) is sent by making into control data the identification number memorized by RAM (126) in telephone at the exchange. In an exchange side, CPU (37) receives the above-mentioned identification number through a line card (15), a data highway (233), and I/O (33). It is recognized as CPU (37) being the multirole key telephone system machine by which the terminal connected to the port of PN=2 from the identification number was connected to the port of former PN=1. Then, the data corresponding to the terminal accumulated in memory (41) are rewritten (customer-data etc.).

[0112] Just as it is, the contents memorized as information on PN=1 are moved to the information on PN=2 as it is, and are changed to it. Thereby, after movement becomes usable in the same state as change before only by operation which connects the telephone line. Though natural, how to assign the function of each key is also the same.

[0113] Although the exchange knows that the terminal was connected to a certain port and sends out an identification number sending-out demand by the above inquiries when connecting standard telephones other than a multirole key telephone system etc. to the exchange in this example, since there is no response, the exchange recognizes the above-mentioned terminal to be terminals other than a multirole key telephone system.

[0114] The next port will be asked if the data corresponding to the terminal are already set at this time. If the data corresponding to the terminal are not set, to a maintenance terminal (45), the placing demand of the data corresponding to the terminal (telephone) is sent out, and it becomes the waiting for an input.

[0115] Next, the case where performance registration of a message and deletion and a change etc. is made by the exchange side is explained. This is performed by I/O processing as

processing of the exchange. First, a key in is carried out to "ORG" from a terminal (45). Then, it is displayed as "CODE?" by I/O processing. On the other hand, "0001" is struck from a terminal (45). This is an authorization code for a message input. Then, it is displayed as "MODE?" by I/O processing. this — the input of a message — new registration and change — **** — I/O processing is requiring that it should specify whether it is—izing

[0116] On the other hand, what is necessary is just to carry out the key in of "NEW", "CHG", and the "DEL" from a terminal (45), respectively. What is necessary is just to input the identifier and the message after the key in, according to this, since the inquiry called "MESSAGE?" with "NUMBER?" is carried out.

[0117] Thus, in I/O processing, if new registration of a message, change, deletion, etc. are completed, this purport will be told to a background job, and will suit transform processing, and a message and an identifier (change portion) will be sent to a telephone terminal (11) in between.

[0118] Next, a message transfer when telephone without a display, i.e., standard telephone, is connected to the exchange system in this example is explained. Here, a message shall be changed into voice and it shall transmit to standard telephone. As this whole time composition is shown in drawing 22, the point that the speech synthesis circuit (301) is established in the exchange (13) side is the feature.

[0119] This speech synthesis circuit (301) is equipped with CPU (303), ROM (305) and RAM (307), and I/O (311) as shown in drawing 23. CPU (303) processes according to the program memorized in ROM (305). Moreover, in ROM (305), correspondence with the word dictionary for speech synthesis, the parameter data for rule composition and the above-mentioned identifier, and a message is also memorized.

[0120] Of course, this correspondence is partly considered as the method of setting the contents is the above-mentioned, when making RAM which RAM (307) may be made to memorize memorize.

[0121] When the exchange performs a message transfer, the state of a destination terminal has been acquired from customer data as mentioned above. CPU (37) of the exchange (13) sends an identifier (a variable data may be added further) to the above-mentioned speech synthesis circuit (301) as the destination is standard telephone as a result. This is performed through a data highway (233). CPU (303) will start speech synthesis processing, if an identifier is received through I/O (311) and a common bus (309).

[0122] For example, suppose that "50300" was now sent to CPU (303) as an identifier + variable data. First, the message corresponding to "5" is read from ROM (305) to this. And it changes into the form of "KAIGICHUU 03:00 MADE." It synthesizes voice and changes into the PCM voice data of a 8kHz interval so that this may be described below. The processing flow of speech synthesis is shown in drawing 24. With reference to a word dictionary, reading and an accent are given for every word to the above message data. In this example, reading of "SANJI" is given to "03:00."

[0123] Next, the accent and pause as a clause are given, and talk, and conversion into language is performed. Then, based on a vocal parameter, rule speech synthesis is performed and the PCM data "KAIGICHUU SANJIMADE" of a 8kHz interval are obtained. This data is sent to a line card (15) through a PCM highway (17).

[0124] In a line card, this PCM data is changed into an analog sound signal, and is sent to standard telephone (321), and a message transfer accomplishes it. At this time, you may add the sound and the guidance sentence which show that it is the registered message before a message. Moreover, you may recover message sending out until it places a headset in standard telephone (321).

[0125] As mentioned above, although explained per example of this explanation, this invention is not limited to this example. For example, a line card, a trunk card, etc. may be made to distribute the CPU memory of the exchange etc., a message may be accumulated in the memory of each card, and the transmission system between the exchange and a telephone terminal and a format are not restricted to this invention. In a telephone terminal, CRT, Light Emitting Diode, LCD, and what other displays may be used, and a key array and a key stroke are not restricted to this example, either.

[0126] Even if it makes it message selection, a direct identifier may be chosen, for example with a dial pad etc., and it does not restrict to this method. It is clear that you may not be about a tablet at a data terminal connectable with a telephone terminal, either. Moreover, it is clear that it is not what is restricted to this example also about the example of a message and a control signal code. Moreover, a setup of the identifier to a message is not limited to an example, either.

[0127] In an example, although the message with the high operating frequency in a company was regarded as a fixed message and these were discriminated by the identifier, it is arbitrarily determined in a system to what message an identifier is given. Moreover, as an identifier, a number may be given like an example and a sign may be used. Moreover, you may use the address of memory for an identifier. Moreover, there is not necessarily no need that a message is common about all telephone terminals, and a limit may be imposed on the message which can be used with a telephone terminal.

[Translation done.]

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- 3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] Drawing showing the feature of this invention

[Drawing 2] The whole system block diagram concerning one example,

[Drawing 3] Drawing for explaining the two-wire bidirectional burst transmission method (ping pong transmission system) used in this example,

[Drawing 4] The signal format in ping-pong transmission,

[Drawing 5] Drawing showing that a control signal is multi-framing composition,

[Drawing 6] Drawing showing NRZ signal and DP signal exception,

[Drawing 7] The external view of the telephone terminal with a display used in this example,

[Drawing 8] The electric block diagram of the telephone with a display shown in drawing 7 ,

[Drawing 9] The concrete circuit diagram of the hybrid circuit (139) circumference in drawing 8 ,

[Drawing 10] The concrete block diagram of the line card in the system shown in drawing 2 (15),

[Drawing 11] Drawing showing the example of a display in the telephone terminal with a display shown in drawing 7 (example of a display of a softkey),

[Drawing 12] Customer data dealing with the port memorized in the exchange, and drawing showing a message during a set,

[Drawing 13] State transition diagram

[Drawing 14] Drawing showing the data format of a message setting demand,

[Drawing 15] Drawing showing the data format of a message sending-out demand,

[Drawing 16] Drawing showing a flow chart in order to explain processing of CPU in the exchange (37),

[Drawing 17] Drawing showing the concrete procedure of the initial program in drawing 16 ,

[Drawing 18] Drawing showing the inquiry at the time of mounting map creation, and the format of a response,

[Drawing 19] Drawing showing the example of a concrete input procedure at the time of inputting a message from the terminal (45) shown in drawing 2 ,

[Drawing 20] Drawing showing the format of the signal used when carrying out initial setting of the identifier-message from an exchange side to a terminal side,

[Drawing 21] Drawing showing the flow of the processing which checks the connection state of the terminal which suits exchange operation and is performed in between etc., and updates customer data automatically,

[Drawing 22] A block diagram when [whole] standard telephone is intermingled as a terminal,

[Drawing 23] The concrete block diagram of the speech synthesis circuit (301) in drawing 22 ,

[Drawing 24] In the speech synthesis circuit of drawing 23 , it is drawing showing the processing for obtaining PCM voice data from message data.

[Translation done.]

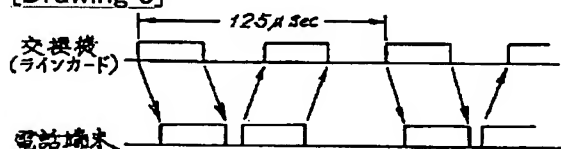
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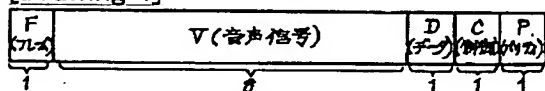
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DRAWINGS

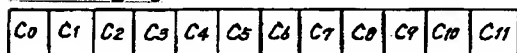
[Drawing 3]



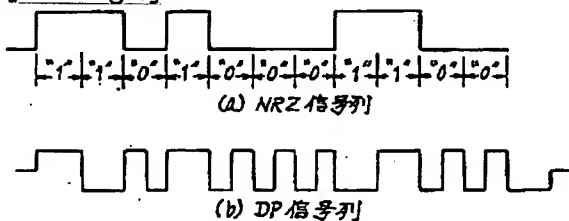
[Drawing 4]



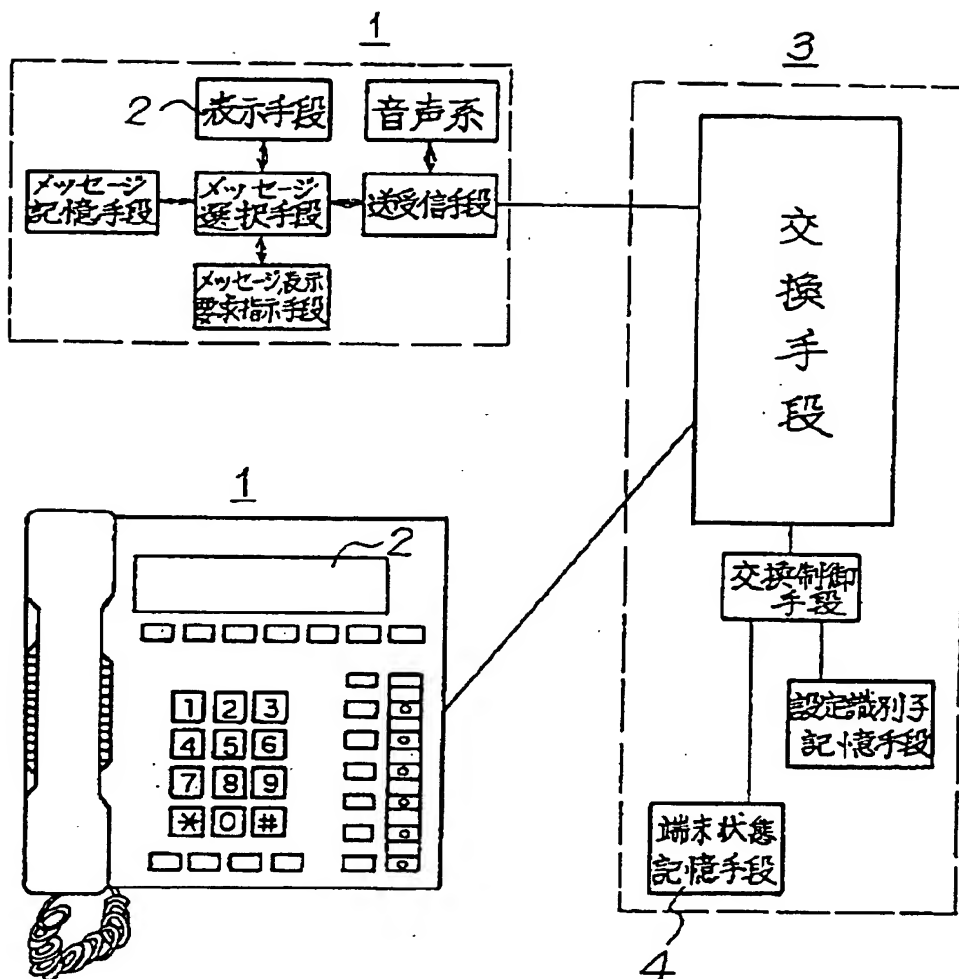
[Drawing 5]



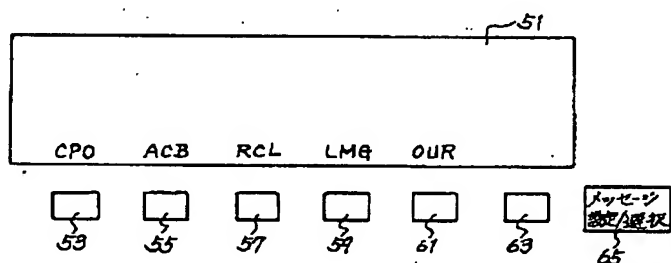
[Drawing 6]



[Drawing 1]



[Drawing 11]



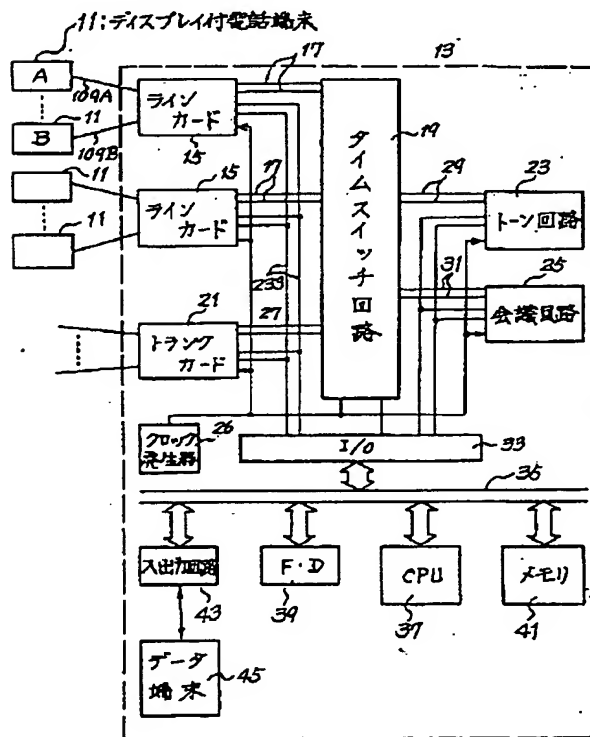
[Drawing 12]

ポート No.	カスタマデータ			セット中メッセージ		
	端末 種別	Tel No.		状態	識別子	可変データ部
0						
1						
2						
3						
i	ディスプレイ 端末	2621		7	5	0300
j						
P						

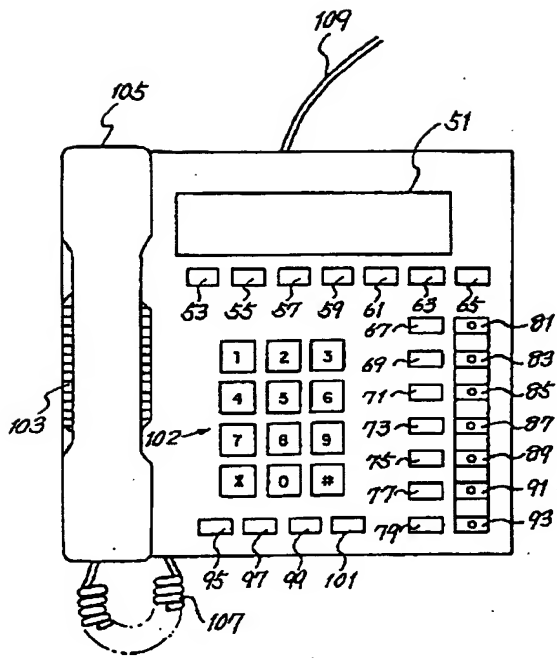
[Drawing 18]

	C ₀	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	C ₇	C ₈	C ₉	C ₁₀	C ₁₁	C ₁₂	
	1	1	0	0	0	0	0	0	0	0	0	1	1	問合わせ
	1	1	0	0	0	0	0	0	0	0	1	1	0	応答

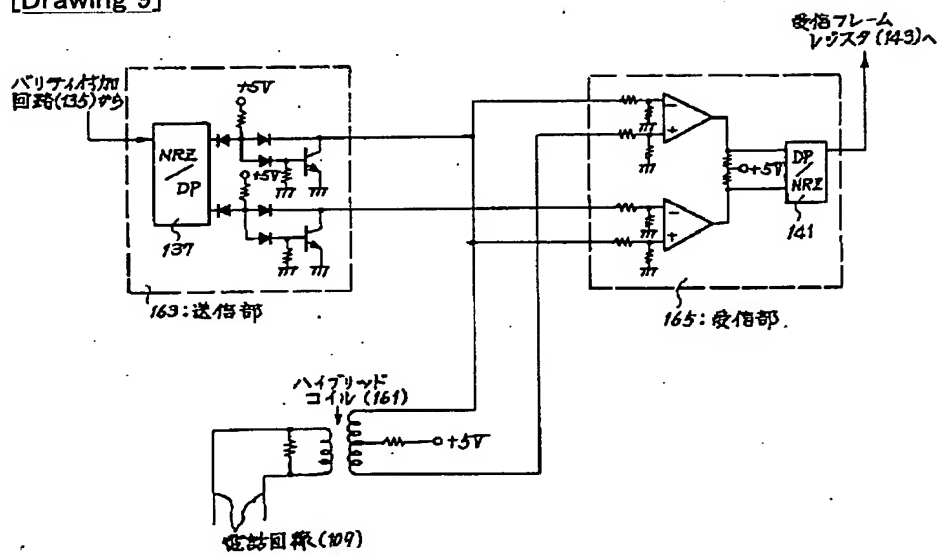
[Drawing 2]



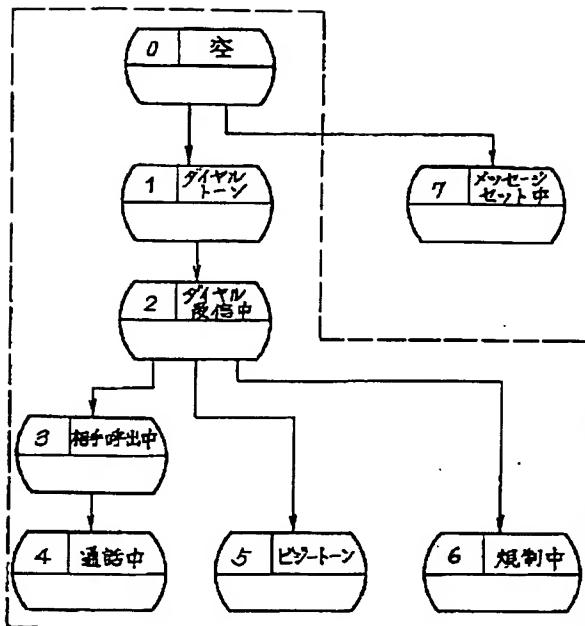
[Drawing 7]



[Drawing 9]



[Drawing 8]



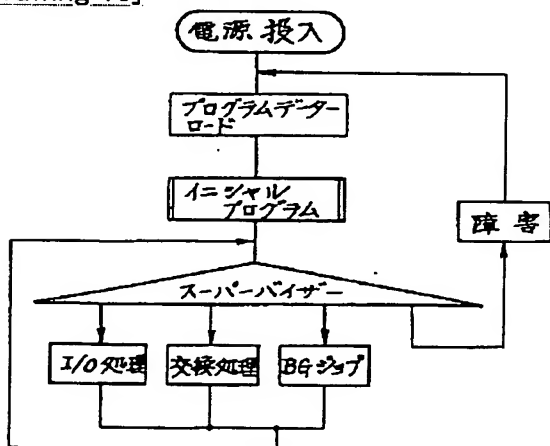
[Drawing 14]

C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	
1	0	1	0	0	0	0	0	0	0	1	1	メッセージ設定要求
1	1	1	0	0	0	0	0	1	0	1	1	メッセージの識別子番号
1	0	0	0	0	0	0	0	0	0	0	1	時間, 月日 および メッセージの中 の変数データ
1	0	0	0	0	0	0	0	0	1	1	1	
1	0	0	0	0	0	0	0	0	0	0	1	
1	0	0	0	0	0	0	0	0	0	0	1	
1	0	1	0	0	0	0	0	0	1	1	0	メッセージ設定終了

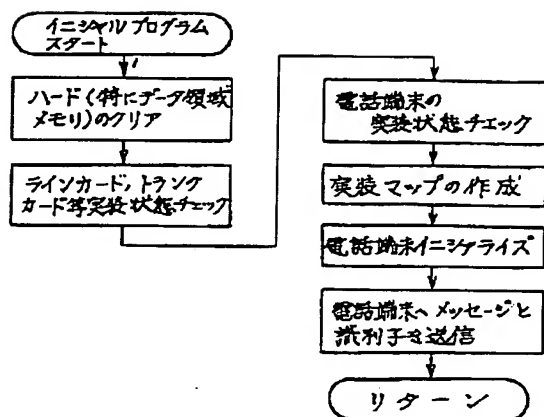
[Drawing 15]

C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	
1	0	1	1	0	0	0	0	0	0	0	1	メッセージ送出要求
1	1	1	0	0	0	0	0	1	1	0	1	メッセージの識別子
1	0	1	1	1	0	0	0	0	0	0	0	メッセージ送出終了

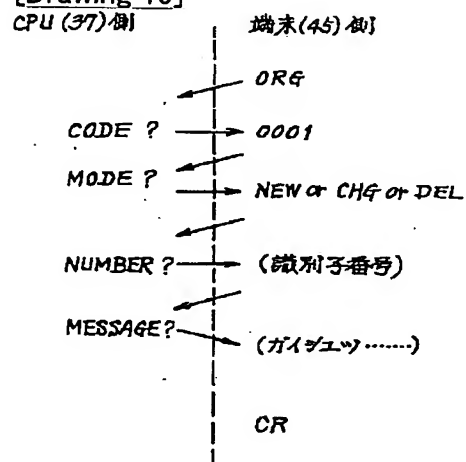
[Drawing 16]



[Drawing 17]



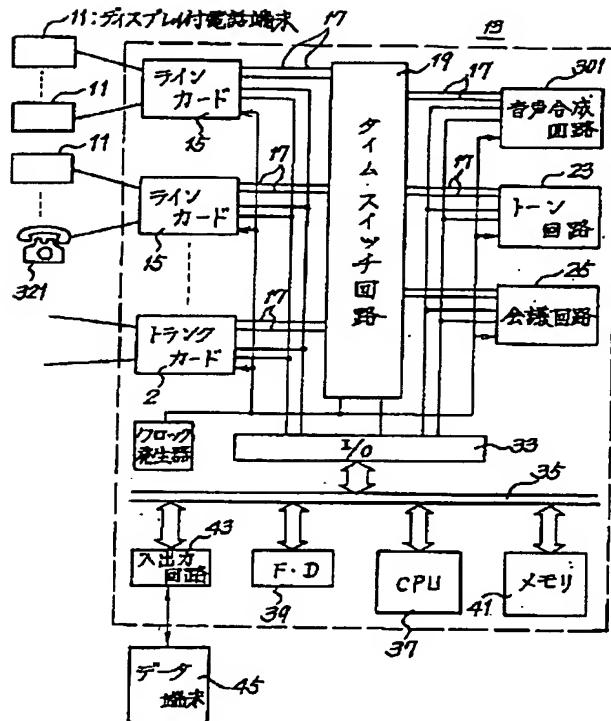
[Drawing 19]



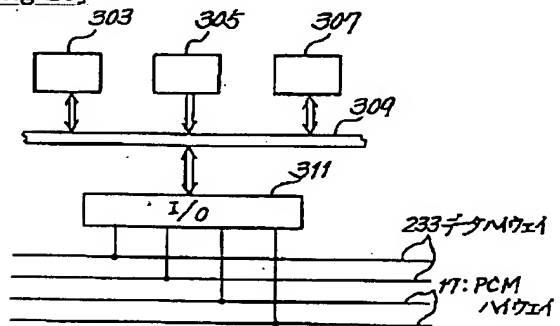
[Drawing 20]

C ₀	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	C ₇	C ₈	C ₉	C ₁₀	C ₁₁	
1	0	1	0	0	0	0	0	1	0	0	1	メッセージ 記憶要求
1	1	1	0	0	0	0	0	0	0	1	0	メッセージの 識別子番号
1	0	0										メッセージ
1	0	0										
1	0	0										
1	0	0										
1	1	1	0	0	0	0	0	0	1	0	0	メッセージの 識別子番号
1	0	0										メッセージ
1	0	0										
1	0	1	0	0	0	0	0	1	0	1	0	メッセージの 記憶終了命令

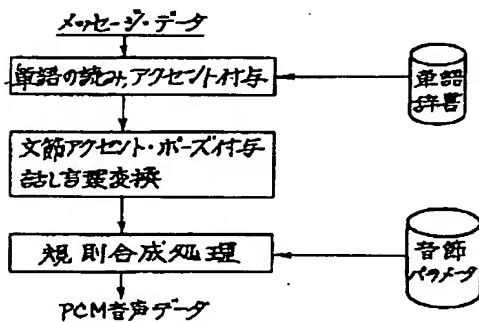
[Drawing 22]



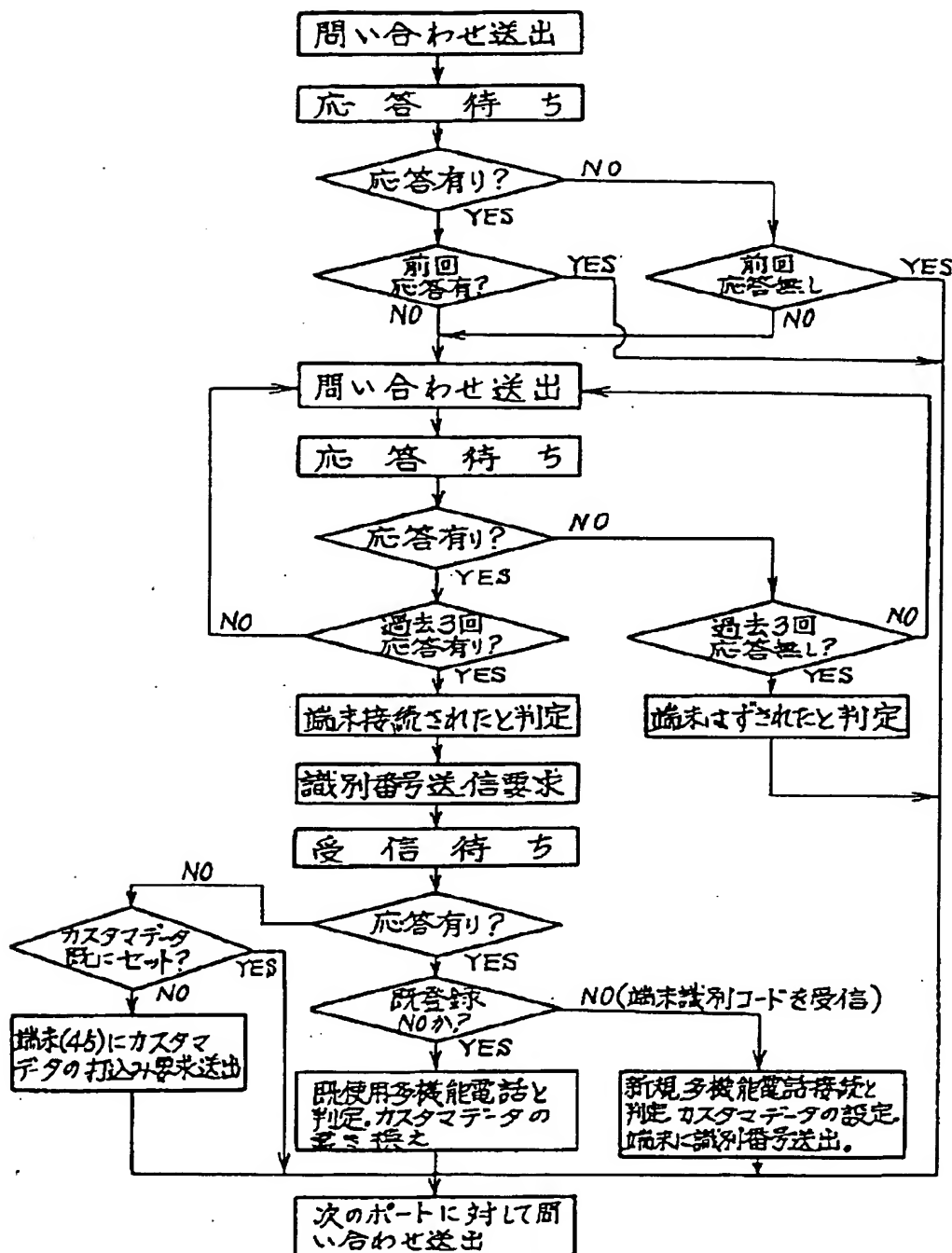
[Drawing 23]



[Drawing 24]



[Drawing 21]



[Translation done.]

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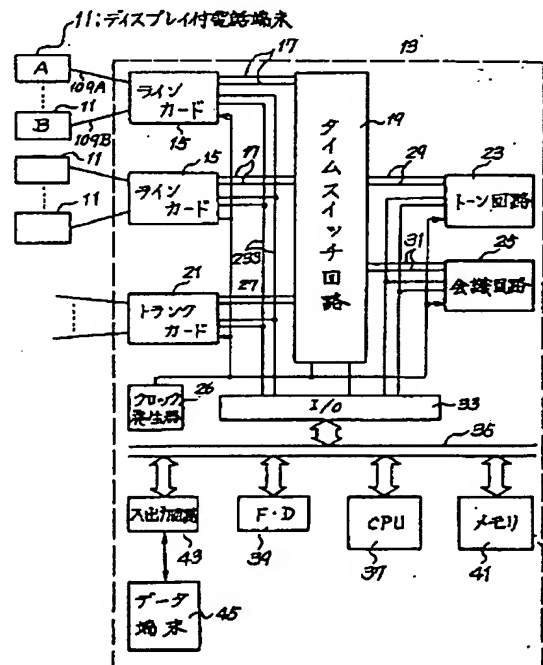
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(54) 【発明の名称】 電話交換システム及びこのシステムで用いられる電話端末装置

(57) 【要約】

【課題】 本発明は、最も広く普及している電話によって、音声以外の媒体、表示に供されるメッセージが利用できると共に、より具体的なメッセージを知らせることができ、かかるメッセージの伝送量が削減でき、伝送時間の短縮が図れる電話交換システム及びこのシステムで用いられる電話端末装置を提供することを目的とする。

【解決手段】 本発明の電話交換システム及びこのシステムは、主に、固定メッセージと固定メッセージを識別する識別子との対応関係を記憶する記憶手段と可変メッセージが入力可能な入力手段と、識別子と可変メッセージとからなるメッセージ情報を送信する送信手段と、メッセージ情報を受信する受信手段と、メッセージ情報のうち識別子に基づき記憶手段から固定メッセージを読み出し、固定メッセージとメッセージ情報の可変メッセージとを相互に関連付けて表示手段にて表示する制御手段を有することにより構成される。



【特許請求の範囲】

【請求項1】 少なくとも一の固定メッセージと前記固定メッセージに対応して設けられた識別子とを記憶する記憶手段を利用し、交換装置に接続された電話端末間の電話回線の少なくとも一部にて前記識別子によるメッセージ伝送が可能な電話交換システムにおいて、前記電話端末のうち被呼端末は、可変メッセージを入力する入力手段と、固定メッセージに対応する識別子を特定する特定手段と、前記入力手段により入力された可変メッセージと特定手段により特定された識別子とを送信する第一の送信手段と、前記交換装置は、前記電話端末でのメッセージ設定状況を記憶する第一の記憶手段と、前記第一の送信手段により送られてきた可変メッセージと識別子とを記憶する第二の記憶手段と、前記固定メッセージと前記可変メッセージとを相互に関連付けて表示するための表示情報を前記電話端末のうち発呼端末に送信する第二の送信手段とを有し、前記電話端末のうち発呼端末は、前記メッセージが表示可能な表示手段を有し、前記発呼端末から前記被呼端末に対し呼びがかけられた際に前記交換装置にて前記第一の記憶手段のメッセージ設定状況に基づきメッセージが設定されていると判断された場合は、前記発呼端末の表示手段にて前記表示情報により前記固定メッセージと前記可変メッセージとを相互に関連付けて表示することを特徴とする電話交換システム。

【請求項2】 更に前記被呼端末の送信手段は前記固定メッセージに対応する識別子のみの送信を可能とし、前記発呼端末の表示手段にて前記固定メッセージのみの表示も可能であることを特徴とする請求項1記載の電話交換システム。

【請求項3】 前記被呼端末は、前記識別子に対応する前記固定メッセージと前記可変メッセージとによる前記発呼端末の表示手段での表示内容とほぼ同じ内容を表示する表示内容確認手段を有することを特徴とする請求項1記載の電話交換システム。

【請求項4】 他の電話端末から呼びをかけられたときにメッセージが設定されている場合、少なくとも電話回線を介して伝送可能な識別子に対応する固定メッセージを前記他の電話端末の表示手段にて表示される電話交換システムで用いられる電話端末装置において、可変メッセージを入力する入力手段と、前記固定メッセージに対応する前記識別子を特定する特定手段と、前記他の電話端末の表示手段にて前記識別子に対応する前記固定メッセージと前記可変メッセージとを相互に關

連付けて表示させるために、前記特定手段にて特定された前記識別子と前記入力手段により入力された前記可変メッセージとを相互に関連付けて送信する送信手段とを有することを特徴とする電話端末装置。

【請求項5】 前記他の電話端末の表示手段にて前記固定メッセージのみの表示を可能とするため前記送信手段は更に前記固定メッセージに対応する識別子のみ送信も可能であることを特徴とする請求項4記載の電話端末装置。

【請求項6】 前記識別子に対応する前記固定メッセージと前記可変メッセージとによる前記他の電話端末の表示手段での表示内容とほぼ同じ内容を表示する表示内容確認手段を有することを特徴とする請求項4記載の電話端末装置。

【請求項7】 電話回線を介して伝送可能な固定メッセージに対応する識別子が特定されている他の電話端末に呼びをかけた場合、前記他の電話端末から送られてくる前記識別子により前記固定メッセージが少なくとも自己の表示手段にて表示される電話交換システムで用いられる電話端末装置において、前記他の電話端末にて可変メッセージが入力されている場合は、前記識別子に対応する固定メッセージと前記可変メッセージとを前記表示手段にて相互に関連付けて表示する表示手段を有することを特徴する電話端末装置。

【請求項8】 表示手段と、固定メッセージと前記固定メッセージを識別する識別子との対応関係を記憶する記憶手段とを有する複数の電話端末を含み、メッセージ通信を行う電話交換システムであって、発信電話端末は、前記固定メッセージに対応する識別子に続いて可変メッセージが入力可能な入力手段と、前記識別子と可変メッセージとからなるメッセージ情報を送信する送信手段と、受信電話端末は、前記メッセージ情報を受信する受信手段と、前記メッセージ情報のうち識別子に基づき前記記憶手段から固定メッセージを読み出し、前記固定メッセージと前記メッセージ情報の可変メッセージとを相互に関連付けて前記表示手段にて表示する制御手段を有することを特徴とする電話交換システム。

【請求項9】 固定メッセージと前記固定メッセージを識別する識別子との対応関係を記憶する記憶手段と、前記識別子と可変メッセージとを受信する受信手段と、前記固定メッセージと前記可変メッセージとのうち少なくともいずれか一を表示する表示手段と、前記受信手段にて受信する前記識別子に対応する固定メッセージを読みだし、前記固定メッセージと前記メッセージ情報の可変メッセージとを相互に関連付けて前記表示手段にて表示する制御手段を有することを特徴とする電話端末装置。

【請求項10】 更に前記受信手段は前記固定メッセージのみの受信を可能にし、前記表示手段は前記固定メッセージのみの表示を可能とすることを特徴とする請求項9記載の電話端末装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、メッセージ通信を行うことのできる電話交換システム及びこのシステムで用いられる電話端末装置に関する。

【0002】

【従来の技術】情報化社会を支える通信媒体として電話、ファクシミリ等がある。これらの技術は非常に優れてはいるが欠点もある。例えば電話は最も広く普及しており、便利な装置であるが、音声しか伝送できず、システム側からすると提供できるサービスに限界があった。これはファクシミリでは同様であった。又、電話による新しいサービスを提供するものとして音声メールがある。この音声メールは、被呼者の状態にかかわらず発呼者が情報を伝送し得る点で優れているが、電話が用いている音声という媒体を用いており、電話の異なる使い方を示すにすぎず、サービスとしても不充分であった。

【0003】また、かかる電話のうち表示器付きのものを利用して、相手電話へメッセージを送りこの表示器にメッセージを表示させることにより情報を伝達させるサービスが考えられた。しかし、ここで利用されるメッセージは固定的なものであったためメッセージ内容に一層の情報量が要求される一方、メッセージの伝送時間の遅延を伴わないものが要求されていた。

【0004】

【発明が解決しようとする課題】本発明は、以上の欠点を除去し、最も広く普及している電話によって、音声以外の媒体、表示に供されるメッセージが利用できると共に、より具体的なメッセージを知らせることができ、かかるメッセージの伝送量が削減でき、伝送時間の短縮が図れる電話交換システム及びこのシステムで用いられる電話端末装置を提供することを目的とする。

【0005】

【課題を解決するための手段】第一の本発明の電話交換システムは、少なくとも一の固定メッセージと固定メッセージに対応して設けられた識別子とを記憶する記憶手段を利用し、交換装置に接続された電話端末間の電話回線の少なくとも一部にて識別子によるメッセージ伝送が可能な電話交換システムにおいて、電話端末のうち被呼端末は、可変メッセージを入力する入力手段と、固定メッセージに対応する識別子を特定する特定手段と、入力手段により入力された可変メッセージと特定手段により特定された識別子とを送信する第一の送信手段と、交換装置は、電話端末でのメッセージ設定状況を記憶する第一の記憶手段と、第一の送信手段により送られてきた可変メッセージと識別子とを記憶する第二の記憶手段と、

固定メッセージと可変メッセージとを相互に関連付けて表示するための表示情報を電話端末のうち発呼端末に送信する第二の送信手段とを有し、電話端末のうち発呼端末は、メッセージが表示可能な表示手段を有し、発呼端末から被呼端末に対し呼びがかけられた際に交換装置にて第一の記憶手段のメッセージ設定状況に基づきメッセージが設定されていると判断された場合は、発呼端末の表示手段にて表示情報により固定メッセージと可変メッセージとを相互に関連付けて表示することにより構成される。

【0006】また、第一の本発明の電話端末装置は、他の電話端末から呼びをかけられたときにメッセージが設定されている場合、少なくとも電話回線を介して伝送可能な識別子に対応する固定メッセージを他の電話端末の表示手段にて表示される電話交換システムで用いられる電話端末装置において、可変メッセージを入力する入力手段と、固定メッセージに対応する識別子を特定する特定手段と、他の電話端末の表示手段にて識別子に対応する固定メッセージと可変メッセージとを相互に関連付けて表示させるために、特定手段にて特定された識別子と入力手段により入力された可変メッセージとを相互に関連付けて送信する送信手段とを有することにより構成される。

【0007】第二の本発明の電話端末装置は、電話回線を介して伝送可能な固定メッセージに対応する識別子が特定されている他の電話端末に呼びをかけた場合、他の電話端末から送られてくる識別子により固定メッセージが少なくとも自己の表示手段にて表示される電話交換システムで用いられる電話端末装置において、他の電話端末にて可変メッセージが入力されている場合は、識別子に対応する固定メッセージと可変メッセージとを表示手段にて相互に関連付けて表示する表示手段を有することにより構成される。

【0008】第二の本発明の電話交換システムは、表示手段と、固定メッセージと固定メッセージを識別する識別子との対応関係を記憶する記憶手段とを有する複数の電話端末を含み、メッセージ通信を行う電話交換システムであって、発信電話端末は、固定メッセージに対応する識別子に続いて可変メッセージが入力可能な入力手段と、識別子と可変メッセージとからなるメッセージ情報を送信する送信手段と、受信電話端末は、メッセージ情報を受信する受信手段と、メッセージ情報のうち識別子に基づき記憶手段から固定メッセージを読み出し、固定メッセージとメッセージ情報の可変メッセージとを相互に関連付けて表示手段にて表示する制御手段を有することにより構成される。

【0009】第三の本発明の電話端末装置は、固定メッセージと固定メッセージを識別する識別子との対応関係を記憶する記憶手段と、識別子と可変メッセージとを受信する受信手段と、固定メッセージと可変メッセージと

のうち少なくともいずれか一を表示する表示手段と、受信手段にて受信する識別子に対応する固定メッセージを読みだし、固定メッセージとメッセージ情報の可変メッセージとを相互に関連付けて表示手段にて表示する制御手段を有することにより構成される。

【0010】

【発明の実施の形態】次に、この発明の実施例を図面に従って説明する。

【0011】この実施例に係るシステムを図2に示す。このシステムは、ディスプレイを備えた電話端末（以下、電話端末と呼ぶときは、原則としてこのタイプのものとする。）（11）と、交換系（13）とから成る。このシステムでは、一の電話端末（11）においてメッセージが入力指示されると他の電話端末（11）に対してメッセージが転送表示される。メッセージが転送されるのは、一の電話端末（11）から他の電話端末（11）への直接のメッセージの送出である場合、又は他の電話端末（11）から一の電話端末（11）への発呼の場合である。メッセージの転送については、後述するように識別子を用いる点がこの発明の一つの特徴である。

【0012】次に、系について詳述していく。まず、交換系（13）は、図2に示されるように、電話端末（11）を交換系（13）に導くラインカード（15）を含んでいる。ラインカード（15）と電話端末（11）間とは、後述するように二線式双方向バースト伝送（ピンポン伝送）で接続されている。なお、図2中では電力供給線を省略している。同一のラインカード（15）に対しては、複数（2～4個）の電話端末（11）が接続されている。ラインカード（15）からは、PCMハイウェイ（17）がタイムスイッチ回路（19）に延びている。

【0013】このタイムスイッチ回路（19）には、ラインカード（15）ばかりでなく、トランクカード（21）、トーン回路（23）、会議回路（25）もPCMハイウェイ（27）、（29）、（31）を介して接続されている。PCMハイウェイには、音声信号又はデータ信号が乗っている。

【0014】タイムスイッチ回路（19）は、PCMハイウェイ（17）、（27）、（29）、（31）の信号についてのタイムスロットの変更等を行うものである。

【0015】トランクカード（21）は局線、専用線等が接続されるカードである。

【0016】トーン回路（23）は、各種トーンを電話端末（11）や局線に送出するものである。各種トーンは、デジタル信号としてこの回路（23）から供給される。

【0017】会議回路（25）は、3者以上の通話を行う場合の演算を行うものである。

【0018】なお、ラインカード（15）、タイムス

witch回路（19）、トランクカード（21）、トーン回路（23）、会議回路（25）には、クロック発生器（26）から基準クロックが供給され、動作が規定される。ラインカード（15）、トランクカード（21）、トーン回路（23）、会議回路（25）には、一対の制御線が接続されている。制御線他端は、I/O（33）に接続されている。

【0019】I/O（33）に対して共通バス（35）が設けられており、この共通バス（35）には、CPU（37）、フロッピーディスク（FD）（39）、メモリ（41）、入出力回路（43）がぶら下がっている。

【0020】フロッピーディスク（39）には交換制御動作のプログラム、各種データが記憶されている。フロッピーディスク（39）の記憶内容は、メモリ（41）にロードされ、メモリ（41）内の記憶内容に従いCPU（37）は動作する。フロッピーディスク（39）は、メモリ（41）のバックアップ用として用いられている。

【0021】入出力回路（43）には、データ端末（45）が接続されている。データ端末（45）は、後述するようなカスタマデータの入力や保守管理に用いられる。カスタマデータは、電話端末の種別、電話番号、各機能電話ではキーの機能割り当て等の属性情報である。又、この実施例では、このデータ端末（45）からメッセージも入力される。

【0022】次に、電話端末（11）とラインカード（15）との間の伝送方式について説明する。

【0023】前述のように、この実施例では、二線式双方向バースト伝送方式を用いる。この方式では、電話端末（11）と交換系機（ラインカード（15））との間で信号をピンポンのように送受している。図3に示すように、所定フォーマットの信号がラインカード（15）から電話端末（11）へバースト状に送信される。これに対して、電話端末（11）からラインカード（15）へ信号がバースト状に送信される。これを125μsec内に行う。

【0024】次に、この伝送方式での信号フォーマットを説明する。図4に示すように、12ビットで1フレームを形成している。先頭の1ビットは、フレーム同期ビット（F）、次の8ビット（V）が音声信号に割り当てられる。続いて、データに1ビット（D）、制御信号に1ビット（C）が割り当てられ最後の1ビットがパリティ（P）用である。

【0025】音声信号だけを見れば125μsec毎に8ビットが伝送されることになり、64kbps PCM実時間伝送を実現している。データ（D）は、電話端末（11）にデータ端末等が接続され、電話回線を利用してデータ伝送も同時に行うときに用いられる。音声伝送を行わないときは、音声信号用ビット（V）をも利用すれば良い。

【0026】制御信号ビット(C)は、通常、電話端末(11)の制御のための信号であり、12ビットで一単位を成す。すなわち、図4に示すフォーマットの信号を12回受信し、制御ビットCを12個蓄積することによって、図5に示す制御信号を得る(12マルチフレーム構成)。送信は、これとは逆に、個々のビットに分けて送信すればよい。パリティ(P)は、パリティチェックのためのビットである。

【0027】以上のように、電話端末(11)とラインカード(15)の間の伝送方式は、二線式双方向バースト伝送(ピンポン伝送)が採用されるが、個々の信号は、伝送路上ではダイフェーズ符号化が施されている。ダイフェーズ符号化は、クロックに同期してレベルが変化し、しかも、「1」に対しては、その信号レベルが同一クロック区間で一定であり、「0」に対しては、その信号レベルが同一クロック区間で変化する符号化である。

【0028】NRZ信号列に対してDP信号列が規定される具体例を図6(a)、(b)に示す。なお、ここでのNRZ信号は、データに対してデューティ比が100%で表現することを意味するだけである。よって、ここでNRZ信号列は、電話端末(11)、ラインカード(15)内のデジタルデータとして考えればよい。なお、必要なハードウェア構成については後述する。

【0029】次に、電話端末(11)について更に詳述する。ここでの電話端末(11)の外観は、図7に示すようにLCD(51)を備えた点が大きな特徴である。このLCD(51)の下にソフトキー(53)及至(63)が設けられている。1つのソフトキー(65)は、LCD(51)外に設けられている。このソフトキー(53)及至(65)の機能は、端末の状態に応じて割り当てられる。LCD(51)内のソフトキー(53)及至(63)に対応する部分には、端末の状態により割り当てられる機能の名称が表示される。

【0030】このソフトキー(53)及至(65)の他に、ファンクションキー(67)及至(79)が設けられている。このファンクションキー(67)及至(79)には、各種機能がプログラマブルに割り当てられている。このキー(67)及至(79)の右側に、このキーの(67)及至(79)の状態を示すLED(81)及至(93)が設けられている。

【0031】更にファンクションキー(67)及至(79)の他に、ファンクションキー(95)及至(101)が設けられている。ファンクションキー(67)及至(79)、(95)及至(101)は、固定的な機能、例えば、オートダイヤル等の機能が固定的に割り当てられており、端末の状態に応じて割り当てられる性質のものではない。

【0032】電話端末(11)の筐体上部中央部には、ダイヤルパッド(102)が設けられている。

【0033】又、筐体上部左側にはスピーカ(103)が、送受話器(105)が設けられている。この送受話器(105)は、筐体にコード(107)を介して接続されている。このような電話端末(11)は、電話回線(102)を介して交換機(ラインカード(15))と接続されている。

【0034】次に、電話端末(11)の電子的構成を図8に従って説明する。ここでは、電話端末(11)にデータ端末(111)を接続し、ドローイングホンタブレット入力装置(113)を備える例について説明する。

【0035】この端末(11)は、ピンポン伝送系(115)と音声系(117)と、操作系(119)と、処理系(121)とから成る。ピンポン伝送系(115)は、電話回線(109)との間で信号を送受し、更に音声データを音声系(117)とやり取りしデジタルデータを処理系(121)、データ端末(111)とやり取りとする。音声系(117)は、デジタル信号と音声との変換を行う。操作系(119)は、操作表と処理系(121)とのマンマシンインターフェースとして考える事ができる。処理系(121)は、データに一定の処理を施すと共に、端末(11)全体の動作を制御する。

【0036】音声系(117)は、送受話器(105)とスピーカ(103)を含む。この音声系(117)は、処理系(121)内のCPU(125)の制御及びタイミング信号T2(後述する)の制御の下にコーデック&フィルタ(127)により、ピンポン伝送系(115)からのPCM音声データをアナログ音声信号に変換する。このアナログ音声信号は、緩衝増幅回路(129)を介して送受話器(105)又はスピーカ(拡声器)に送られ、可聴音となる。コーデック(codex)は、符号器(coder)と復合器(decoder)の両機能を備えたもので、PCM符号復合器である。このコーデック&フィルタ(127)に対するCPU(125)の制御は共通バス(123)音声用I/O(131)を介して行われる。

【0037】送受話器(105)から送られてくるアナログ音声信号は、コーデック&フィルタ(127)を介してピンポン伝送系(115)の送信フレームレジスタ(133)に送られる。送信フレームレジスタ(133)の出力は、パリティ付加回路(135)に送られる。パリティ付加回路(135)の出力は、NRZ/DP変換回路(137)へ送られ、ハイブリッド(139)を介して電話回線(109)へ送出される。

【0038】以上がピンポン伝送系(115)のうち送信部分である。

【0039】これに対して受信時は、ハイブリッド回路(139)からの出力がDP/NRZ変換回路(141)へ供給される。DP/NRZ変換回路(141)の出力は、受信フレームレジスタ(143)に送られる。

受信フレームレジスタ(143)は音声信号用(V)、データ用(D)、制御信号用(C)の各領域を有する。

【0040】ビット数それぞれ8ビット、1ビット、1ビットである。受信フレームレジスタ(143)のうち音声信号用(V)領域のデータは、コーデック&フィルタ(127)の入力となる。同じくデータ用(D)領域のデータは、I/O(RS232C)(145)を介してデータ端末(111)へ送られる。制御信号用(C)領域のデータは、12ビットシフトレジスタ(SR)(147)へ送られる。

【0041】送信フレームレジスタ(133)も同様な構成であって、8ビットの音声信号用(V)領域、1ビットのデータ用(D)領域、1ビットの制御信号用(C)領域から成る。前述のコーデック&フィルタ(127)の出力は送信フレームレジスタ(133)の音声信号用(V)領域に入力する。データ用(D)領域には、I/O(145)を介してデータ端末(111)からのデータが入力する。制御信号用(C)領域には、12ビットシフトレジスタ(149)からの出力が入力する。12ビットシフトレジスタ(147)、(149)は共通バス(123)と接続されている。

【0042】次に動作を説明する。コーデック&フィルタ(127)からの8ビットPCM音声信号は、送信フレームレジスタ(133)内の音声信号(V)用領域に一旦記憶される。

【0043】一方、CPU(125)からは、制御データが12ビット単位で送られ、共通バス(123)を介して、12ビットシフトレジスタ(149)に一旦記憶される。この12ビットシフトレジスタ(149)からの1ビットずつのデータが制御信号用(C)領域に記憶される。12ビットシフトレジスタ(149)からのデータ送出は125 μ secに1回の割合である。これはタイミング信号 T_1 により制御される。データ端末(111)からのデータは、I/O(145)を介してデータ用(D)領域に記憶されるI/O(145)からのデータ送出もタイミング信号 T_1 により制御される。このように、10ビットのデータが用意されたなら、パリティ付加回路(135)においてフレーム同期ビット(F)及び、パリティビット(P)がそれぞれ1ビット付加される。このフォーマットは図4に示すフォーマットと同様である。このデータは、デューティ比100%の形で出力される。これはNRZ(Non-Return-To-Zero)信号と同一形式となる。この信号列はNRZ-DP変換回路(137)でダイフェーズ符号化が施される。その後、ハイブリッド回路(139)を介して、電話回線(109)へ送出される。

【0044】受信時には、ハイブリッド回路(139)から、ダイフェーズ符号化が施された信号がDP/NRZ変換回路(141)においてNRZ信号列に変換される。

【0045】この信号は12ビット単位であって、フレーム同期ビット(F)パリティビット(P)が除外され、先頭から2ビット及至9ビット目のデータが、音声信号用(V)領域に記憶される。続いて10ビット目がデータ用(D)領域に、11ビット目が制御信号用

(C)領域に記憶される。音声信号用領域のデータはコーデック&フィルタ(127)へ入力され、前述のように可聴音に変換される。

【0046】データ用領域のデータは、I/O(145)を介してデータ端末(111)へ送られる。制御信号用領域のデータは、12ビットシフトレジスタ(147)へ送られ、12ビット蓄積されたなら共通バス(123)を介し、CPU(125)へ送られる。

【0047】操作系(119)は、LCD(51)を駆動制御するLCDコントローラ(151)を含む。ダイヤルパッド(102)、ソフトキー(53)及至(65)、ファンクションキー(67)及至(79)、(95)及至(101)からのキー入力情報は、I/O(153)共通バス(123)を介してCPU(125)へ伝えられる。又、ファンクションキー(67)及至(79)の操作状態について情報を得たCPU(125)は、所定の処理を行うと共に、LED駆動系(155)に所定のLED(81)及至(93)を表示させるように命令を与える。

【0048】CPU(125)は、ROM(157)に記憶されたプログラムに従って所定の処理を行う。又、データ端末(111)は、I/O(145)、I/O(159)を介してデータのやり取りを行う。ドローイングホントラブル入力装置(113)からの入力パターン情報は、I/O(159)を介してCPU(125)へ伝えられる。

【0049】次に、NRZ/DP変換回路(137)、ハイブリット回路(139)、DP/NRZ変換回路(141)の具体的構成について図9に従って説明する。

【0050】これらの回路(137)、(139)、(141)は、電話回線(109)とハイブリットコイル(161)を介して電氣的に接続される。そしてNRZ/DP変換回路(137)を中心とした送信部(163)と、DP/NRZ変換回路(141)を中心とした受信部(165)とから成る。

【0051】このような構成により電話回線(109)からの信号が、デジタルデータとして得られ、デジタルデータがダイフェーズ符号化が施されて電話回線(109)に送出される。

【0052】次に、電話端末(11)の動作クロックについて説明する。この実施例では、図8に示されるフレーム検出回路(167)とタイミング制御回路(169)から動作ブロックを得ている。すなわち、フレーム検出回路(167)において受信した信号からフレーム

同期ビットを検出し、この検出タイミングに同期してクロック信号を発生させる。これは、図示しないクロック発生器（タイミング発生回路（169）間に設けられる。）からのクロック信号から上記のフレーム検出に応じてタイミング信号 $T_1 \sim T_4$ を生成する。

【0053】タイミング信号 T_1 は8KHz、タイミング信号 T_2 は64KHz、タイミング信号 T_3 は、256KHz、タイミング信号 T_4 は2MHzのクロック信号である。又、前述したように、送信フレームレジスタ（133）に対しては、コーデック&フィルタ（127）、I/O（145）及び12ビットシフトレジスタ（149）からデータを書き込み、パリティ付加回路（135）へデータの読み出しを行うので、この書き込みと読み出しについては、位相をずらす必要があるのは当然である。受信フレームレジスタ（143）についても同様である。

【0054】次にラインカード（15）について図10に従って説明する。このラインカード（15）は、ハイブリッド回路（201）と送受信回路（203）と、受信フレームレジスタ（205）とを備える。ハイブリッド回路（201）と、送受信回路（203）の構成は、図9に示す具体的構成と同一である。すなわち、電話回線（109）の信号の符号化を解きNRZ信号に変換し、逆にNRZ信号をダイフェーズ信号（DP信号）に変換するものである。ここでNRZ信号は、デジタルデータと同一に考えてよい。ダイフェーズ符号が解かれた信号は、同期信号検出回路（204）において、フレーム同期ビット（F）の検出を行い、この信号に基づいてNRZ信号を、受信フレームレジスタ（205）にロードする。

【0055】このとき、先頭（フレーム同期ビット（F）から数える）から2ビット及至9ビット目のデータは、音声信号用領域に記憶される。10ビット目のデータは、データ用領域に記憶される。11ビット目のデータは、制御信号用領域に記憶される。次に、音声信号用領域及びデータ用領域のデータは、レジスタ（207）、（209）に転送される。このレジスタ（207）、（209）に対して、マルチプレクサ（213）とカウンタ（215）と、コンパレータ（217）とが設けられる。レジスタ（207）、（209）は、クロック信号に基づいて格納データをマルチプレクサに送出する。このクロック信号は、図2に示されるクロック発生器（26）からのクロック信号線（219）を介して供給される。このクロック信号は、カウンタ（215）にも供給され、カウンタ（215）において計数される。カウンタ（215）は、PCMのフレーム同期信号により初期化される。このPCMフレーム同期信号は、フレーム信号線（221）を介してI/O（33）から送られる。

【0056】図2では省略されているがPCMハイウエ

イ（17）等として一緒に設けられていると考えればよい。よって、カウンタ（215）は、PCMのフレームの先頭からクロック信号を計数していき、コンパレータ（217）において、予め定められた値との一致検出が行われる。この予め定められた値は、各ラインカード毎に定められた固有アドレスであって、後述するように各ラインカード（又は電話端末（11））に割り当てられたタイムスロットの番号でもある。

【0057】なお、ラインカード（15）に対して、複数の電話端末（11）が設定されている場合には、こうしてコンパレータ（217）において固有アドレスと計数クロック信号数とが一致したなら、この結果をマルチプレクサ（213）及び後述するデマルチプレクサ（223）に知らせる。マルチプレクサ（213）は、これを受けてレジスタ（207）、（209）の内容を多重化してPCMハイウエイ（17）に送出する。このPCMハイウエイ（17）は前述のように、タイムスイッチ回路（19）に接続されている。

【0058】一方、受信フレームレジスタ（205）の制御信号用領域に記憶された制御信号は、12ビットシフトレジスタ（211）に蓄積される。12ビット分蓄積されたなら、一つの制御信号として、バス（225）を介して、CPU（227）に送られる。

【0059】CPU（227）は、メモリ（229）の記憶内容に従って、一定の処理により解読し、必要があれば、その内容をI/O（231）を介してデータハイウエイ（233）に送出する。データハイウエイ（233）に送出されたデータは、CPU（37）に送られ、所定の処理が施される。

【0060】以上が電話端末（11）から交換機側への伝送であるが、次に交換機側から電話端末（11）への伝送について説明する。PCMハイウエイ（17）を介して送られてくるPCM音声データは、時分割多重されている。このデータがデマルチプレクサ（223）において、ラインカード（15）内に取り込まれる。前述のように、各ラインカード（15）は、固有アドレスが割り当てられており、これが各ラインカード（15）に割り当てられたタイムスロットの番号にもなっている。前述のようにコンパレータ（217）では、PCMのフレームの開始から計数したクロック値と、固有アドレスとの一致を見ており、一致した際には、デマルチプレクサ（223）にもこの結果を知らせる。デマルチプレクサ（223）では、これを受けて受信PCM信号を音声とデータとに分離し、各々レジスタ（235）、（237）とに転送する。レジスタ（235）、（237）は、クロック信号線（219）からクロック信号の供給を受けて動作する。

【0061】データハイウエイ（233）を介して送られてくるデータは、交換制御にとって必要なデータであって、前述のPCMハイウエイ（17）を介して伝送さ

れるデータとは区別される。データハイウェイ（23）を介して送られてくるデータは、I/O（231）を介してCPU（227）に送られ、更に、レジスタ（239）に蓄積される。次に、レジスタ（235）、（237）、（239）の内容が送信フレームレジスタ（241）に転送される。この送信フレームレジスタ（241）は、3つの領域に分かれているのは、受信フレームレジスタ（205）、又は、電話端末（11）での受信フレームレジスタ（133）等と同一である。

【0062】この送信フレームレジスタ（241）の内容は、送受信回路（203）に送られる。この回路（203）において、データは、ダイフェーズ符号化が施さ

れて、ハイブリッド回路（201）を介して電話回線（109）に送出される。次にメッセージ通信について説明する。この実施例では、メッセージを固定部分と可変部分として分離し、前者を識別子により表現している。更に、この実施例では、メッセージ通信を主に上記識別子により行う点に一つの特徴がある。識別子とメッセージの固定部分（以下固定メッセージと呼ぶ）との対応は、例えば表1（以下識別子表と呼ぶ）に示されるごとく設定される。

【0063】

【表1】

識別子	固定メッセージの内容
1	ガイシュツ
2	ガイシュツ _____ キジャ
3	キュウカ
4	シュツチョウチュウ _____ シュツジャ
5	カイギチュウ _____ マデ
6	オキヤクサンデス _____ ヒジョ
⋮	
n	_____ ヘデンワシテクダサイ

表1の固定メッセージ中、下線が施された部分がメッセージの可変部分である。このようにメッセージを固定部分と可変部分とに分けたのは、日常生活、業務において必要なメッセージはパターン化されていることに着目したものである。

【0064】可変部分は必ず必要という訳ではない。この識別子－固定メッセージの対応は、少なくともディスプレイ件電話端末（11）の全てに保持記憶されている。この記憶の仕方には2通りある。

【0065】1つは、ROMに記憶する場合であって、もう1つは、RAMに記憶する場合である。最初の実施例では、ROMに上記対応を記憶させた例について説明する。

【0066】ROMは、読み出し専用メモリであるから予め上記対応を記憶させ、各端末（11）に備えておく必要がある。この場合、交換機側では、この対応を予め持っていることは必ずしも必要ではないが、ここでは端末（11）でのROMと同一の記憶内容をメモリ（41）又は、フロッピーディスク（39）に記憶させておく。初期入力については後述する。

【0067】次にメッセージ通信について説明する。この実施例でのメッセージ通信には2通りのモードがある。メッセージ設定要求モードとし、メッセージ送出要求モードである。メッセージ設定要求モードは、電話端末（11）操作者自体が不在等で、これ以降電話（11）に回答できない時に、予めメッセージを設定しておき、たの端末（11）からは発呼された時、この発呼者に上記メッセージを転送するものである。

【0068】メッセージ送出モードは、他の端末（11）に対して発呼した際に、被発呼者が応答しない時に、メッセージをその被発呼者に送出するものである。

【0069】まず、メッセージ設定要求モードについて説明する。このモードを行うには、まず、電話端末（11）のキー（65）を操作する。このキー（65）は、メッセージ設定／選択キーである。最初このキー（65）を押すと電話端末のCPU（125）は、この操作状態を検出、メッセージ設定モードとする。このモードにおいて、CPU（125）は、識別子表から識別子「1」の内容を呼び出しLCD（51）に表示する。ここでは、識別子「1」に対応する「ガイシュツ、チョッ

キ」が表示される。これは、今必要なメッセージではないので操作者は、メッセージ設定／選択キー（65）を押す。すると、識別子「2」の内容が表示される。以下同様な操作を繰り返し、識別子「5」の内容が表示されたなら、操作者は確認キーを押す。確認キーとしては、ダイヤルパッド（102）中のをを用いてもよいし、ファンクションキー（67）～（79）、（95）～（101）の中から適当に1つを選んで設定しておいてもよい。又、ソフトキー（53）及至（63）の1つに機能を割り当ててもよい。これで固定メッセージの設定が終了した。

【0070】次に、可変メッセージ「03：00」を入力する。これは、ダイヤルパッド（102）を「0」「3」「0」「0」と押す。CPU（125）は、この「0」「3」「0」「0」を、LCD（51）上に表示されているメッセージ中の下線が施された領域に03：00と表示する。すると、「カイギチュウ03：00マデ」と表示される。このとき、CPU（125）は、RAM（156）に識別子「5」と可変メッセージ「0300」を「50300」として記憶しておく。同時に、この「50300」を交換機に対してデータとして送出する。

【0071】これを更に詳しく説明する。このデータの送出は、電話端末（11）の制御信号の送出と同様に行う。この実施例では、ピンポン伝送方式を採用しているので図4に示されるフォーマット中の制御信号用ビットを用いることになる。又、ここで用いるデータ自体は、12ビットで一単位とする。まず、CPU（125）は、メッセージ設定要求を交換機へ送る。この設定要求の一例を図14に示す。ここでは12ビットで一単位であるが、C0は、フレーム同期用ビット、C1、C2は、この12ビットのデータが表わす意味を示すビット、C3～C10は送出するデータC11はパ

リティチェック用ビット（この例では偶数）である。

【0072】このような12ビットのデータをCPU（125）から12ビットシフトレジスタ（149）

（図8に示す）に送出し、前述の手順により交換機に送出される。続いて、メッセージの識別子番号、可変データ（メッセージ中の時間、月日等）、メッセージ設定終了が送出される。交換機側では、以上のようなデータをラインカード（15）で受信し、CPU（37）まで送る。

【0073】CPU（37）は、メッセージ設定要求を受け取り、認識した後、メッセージの識別番号、可変データを認識し、メモリ（41）のメッセージ登録領域に記憶する。このメモリ（41）のメッセージ登録領域の構成について説明する。この実施例ではポート対応で構成し、カスタマデータをも考慮してメッセージ登録領域を構成する。

【0074】この具体例を図12に示す。

【0075】ポートは、例えば、図2のラインカード（15）の端末（11）側の出力端子を指す。ポート番号という場合、ここでは、前述の固有アドレスに対して2ビットを付加した番号を用いればよい。カスタマデータは、電話端末（11）の種別、状態、電話番号、キーの機能割り当て等の属性である。端末（11）の種別としては通常のダイヤル電話、プッシュホン、ディスプレイ付電話、データ端末付電話（例えばコンピュータホン）等である。電話端末（11）の状態とは状態遷移図で用いられるレベルの概念であって、図13及び表2に示されるように、交換制御の見地から見た端末（11）の状態である。この実施例では、状態「7」として「メッセージセット中」という状態を設けた点に特徴がある。

【0076】

【表2】

0	空 き	4	通 話 中
1	ダイヤルトーン	5	リジートーン
2	ダイヤル受信	6	規 制 中
3	相手呼出中	7	メッセ-ジセット中

このようなポート対応のカスタマデータに対してセット中メッセージを記憶する。このセット中メッセージは識別子から成る固定データ部と可変データ部とから成る。ここでは識別子「5」、可変データ部「0300」である。

【0077】このように交換機内が設定されたときに、メッセージを送出した端末（11）以外の端末（11）から、メッセージ送出端末（11）に対して発呼したと

する。交換機内のCPU（37）は、端末（11）からの発呼を受け、ポート対応のカスタマデータをサーチする。このサーチにより、被発呼端末の状態を調べる。状態「0」であれば回線接続を行うが、ここでは端末「5」が状態「7」であって、メッセージ設定中であることをCPU（37）は認識する。

【0078】この後、セット中メッセージを呼び出し、「50300」というデータを発呼端末への制御データ

として送出する。このときの送出手順は、メッセージ設定時の端末(11)から交換機への送出手順と同一であって、交換機内のCPU(37)は、図14に示されるフォーマットでラインカード(15)等を介して発呼端末へ上記制御データを送る。ラインカード(15)及び電話端末(11)間は、前述のようにピンポン伝送方式を用いている。

【0079】メッセージ転送を受けた端末のCPU(125)では、制御データを認識した後、識別子を用いてメモリ(157)から識別子表の内容を呼び出す。ここでは「5」に対応する「カイギチュウ：マデ」を呼び出すことになる。ただし、識別子表を記憶させる際には、「カイギチュウ：マデ」に対応するキャラクタをそのまま記憶してもよいし、キャラクタジェネレータを別に用意し、キャラクタコードを記憶するだけでもよい。

【0080】次に、CPU(125)は、呼び出した固定メッセージと可変データをLCD(57)に表示する。このようにして発呼端末には、「カイギチュウ03：00マデ」という表示が成され、メッセージの転送、表示が成されたことになる。このような表示と同時に被発呼端末の番号、被発呼端末操作者等を表示するようにしてもよい。

【0081】次にメッセージ送出要求モードについて説明する。これは、被発呼端末が通話中のときでも大至急連絡を取りたい場合に必要モードである。例えば秘書が大至急上司と連絡を取り来客を知らせたいときである。このような場合、発呼端末に対しては交換機のトーン回路(23)からビジートーンを送出する。このようなビジートーンを受けると、電話端末(11)のCPU(125)は、キー(53)～(63)に対してキャンポン、自動呼返し、再呼び、メッセージ転送、割り込みの各機能を割り当てる。同時に、LCD(51)内のキー(53)～(63)に対応する部分に、CPO(キャンポン)、ACB(自動呼返し)、RCL(再呼び)、LMG(メッセージ転送)、OUR(割り込み)を表示する。

【0082】次に操作者は、キー(59)を押す。このソフトキー(59)は、この状態では、メッセージ転送キーであって、このキー(59)を押すことにより、以下の処理により作成されたメッセージを被呼先へ転送することになる。

【0083】まず、メッセージの設定がCPU(125)に対して表示される。そして前述のメッセージ設定要求モードと同様に、識別子表が呼び出され、識別子「1」の内容から表示されていく。そしてキー(65)とダイヤルパッド(102)の操作により、メッセージの固定部分が決まる。ここでは識別子「6」を選択するものとする。この例では可変データは不要であって、図15に示される手順及びフォーマットに従ってメッセー

ジがまず交換機へ送出される。交換機のCPU(37)では、メッセージ送出要求を認識すると、図15に示されるフォーマットのデータをそのまま被呼端へ、端末(11)の制御データとして送出する。

【0084】このようにすることにより、被呼端末が通話中(又どのような状態)であってもメッセージは転送可能であって、しかも識別子を用いるので転送量も大幅に削減できる。前述の実施例では、識別子表をROMに記憶させる例について説明したが、当然RAM(Random Access Memory)に記憶させることもできる。しかもこの場合には以下の説明より明らかとなる効果を有する。

【0085】以下に示す説明では、交換機内のフロッピーディスク(39)にデータ端末(45)から識別子-メッセージの対応を入力すると同時に、各電話端末(11)には初期状態において識別子-メッセージの対応が記憶されていないものとする。ハードウェア的な構成は前述実施例と同一であるとする。

【0086】まず、フロッピーディスク(39)への識別子-メッセージの対応関係の入力について説明する。データ端末(45)は、保守用端末であって、この端末(45)からメッセージを書き込む時には、オーソライゼーションコードを入力する。例えば、オーソライゼーションコードが「0003」の時には、以下の処理が診断であり、「0002」の時は、カスタマデータのセットそして「0001」の時は、メッセージの書き込みというように決めておく。ここでは、オーソライゼーションコード「0001」を入力すると、これ以降のデータが識別子番号と(固定)メッセージであるとCPU(37)は認識する。よって、この内容を、フロッピーディスク(39)又はメモリ(41)のRAMで構成された部分に記憶していく。この記憶内容は、第1表に限定されない。

【0087】このようにして、識別子番号とメッセージとの対応が決定したなら、この記憶内容を各電話端末(11)に転送する処理を行う。もっとも、転送という概念は、交換機内のメッセージについての情報がいつ用意されるかといったこととは直接関係はない。すなわち、交換機内ではROMに上記内容を蓄積していてもよいのは当然である。

【0088】さて、上記記憶内容(識別子番号とメッセージとの対応)の転送は、交換機の電源立上げ時、新規端末接続時、メッセージの変更、新規事項付加時等に行うことが好ましい。まず、電源立上げ時の転送について説明する。交換機の電源が投入されると、図16に示されるように、フロッピーディスク(39)に記憶された交換プログラム、必要なデータ(前述のメッセージについてのデータをも含む場合がある。)をロードし、メモリ(41)に記憶させる。次に後述するイニシャルプログラムがスタートとし、このプログラムによる処理が完

了後、スーパーバイザーにより、I/O処理、交換処理、バックグラウンド処理、障害処理等が優先順位に従って実行される。

【0089】次にイニシャルプログラムについて説明する。

【0090】このプログラムは、図17に示されるように、まず、ハードウェア全体のイニシャライズ、特にデータ領域のメモリをクリアするという処理から開始する。

【0091】これは、交換プログラム、必要なデータのロードだけでは、データ領域の初期状態の内容が保証されないからである。データ領域とは、以下に示すラインカード等の実装状態についてのデータの記憶領域であって、上記クリアによって、正しいデータの記憶に先立ち、メモリを初期化している。

【0092】次に、ラインカード(15)、トランクカード(21)等の実装状態をチェックする。このためにCPU(37)から問い合わせ信号を制御信号線(データハイウェイ)を利用してラインカード(15)、トランクカード(21)に送出する。これに対して、各ラインカード(15)等のCPU(227)は、実装されているという返答をCPU(37)に送り返す。この返答は例えば、各ラインカード(15)に与えられている固有の番号等を用いればよい、固有の番号としては、第10図に示されるコンパレータ(217)の基準値として用いている固有アドレスの下位2ビットを省略したものを用いればよい。

【0093】ここで、下位2ビットを捨てたのは、この固有アドレスが、本来電話端末(11)(ポート)に対して設定されたものであって、この実施例では、1つのラインカード(15)に4個の端末(11)が接続するとしたために、固有アドレスの下位2ビット以外のものによりラインカード(15)が識別され、下位2ビットまで含めて電話端末(21)までを識別している。当然、ラインカード(15)に対して接続される端末(11)数が変化すれば固有アドレスの表現も変化するもので、ここでの固有の番号の表現も変化する。このような応答をCPU(37)が受けることによって、ラインカード(15)等の実装を確認する。

【0094】これによって、CPU(37)は、カードの実装についてのマップを得る。次に、電話端末(11)の接続状態のチェックについて説明する。

【0095】交換機のCPU(37)は、問い合わせ信号を制御信号として、各端末(11)に送出する。この実施例での問い合わせ信号のフォーマットは、図5に従うのは当然である。これに対し、電話端末(11)のCPU(125)は、問い合わせ信号を受信すると、例えば自己の固有番号を返答として交換機に送出する。(これについては更に後述する。)

CPU(37)はこの応答を受けて端末(11)の実装

状態についてのマップをつくる。問い合わせ信号とこれに対する応答の一例を図18に示す。このようにしてカード(15)、端末(11)についての実装状態がチェックされ、CPU(37)は実装マップを完成することができる。

【0096】次にCPU(37)は、電話端末(11)をイニシャライズする。このイニシャライズにより、電話端末(11)は、送受信可能になる。続いて、CPU(37)は、フロッピーディスク(39)から読み出され、メモリ(41)に記憶されているメッセージについてのデータを読み出し、端末(11)へ送る。

【0097】このデータの転送は、端末(11)への制御データの転送として行う。このときのデータフォーマットを図20に示す。

【0098】交換機内のCPU(37)は、まず、12ビットから成るメッセージ記憶要求命令を発する。これがラインカード(15)内のCPU(227)により受信されてレジスタ(239)に一旦蓄積される。この後、ピンポン伝送フォーマット中の制御信号用ビットを用いて、電話回線(109)を介して端末(11)へ送られる。端末(11)では受信フレームレジスタ(143)、12ビットシフトレジスタ(147)等を介して、CPU(125)に送られる。

【0099】このような手順により、上記メッセージ記憶要求、メッセージの識別子番号、メッセージが次々と端末(11)に送られる。端末(11)のCPU(125)は、識別子とメッセージとをRAM(156)内に記憶していく。そしてメッセージ記憶終了命令を受けたなら、この処理を終了させる。

【0100】こうして電話端末(11)のCPU(125)は、送られてきたデータをRAM(156)に蓄積する。これにより、交換機と電話端末(11)とは、全く同一の識別子とメッセージを保有することになる。これでイニシャルプログラムは終了し、通常交換プログラムがスタートする。

【0101】CPU(37)は、交換処理の空き時間を利用して、原則的に一定周期で実装マップの更新を行っている。すなわち、新規端末(11)の接続、端末(11)の接続位置の変更(接続ポートの変更)等を行っている。これは、ポート対応で得れば、カスタマデータの自動変更ということになる。カスタマデータの変更が、特に新規端末(11)が交換機の支配する系に接続された場合に起因するときは、上記のイニシャルプログラムと同様にして識別子とメッセージとを当該新規端末(11)へ転送する。新規端末(11)では、転送されたデータをRAMに蓄積し、交換機、たの端末(11)と同一のデータを保有することになる。

【0102】ここで、端末(11)が接続されているか否かのチェックについて詳しく説明する。交換機は一定周期で各ポートに対し、端末が接続されているか、接続

されていないかをチェックするための問い合わせを行っている。この問い合わせに対し、端末が応答する事により、交換機はそのポートに端末が接続されている事を認識する。

【0103】図21に問い合わせ時の交換機の動作をフローチャートで示した。平常時（端末を接続したときや、端末を抜いた時以外）は、交換機は各ポートに対し、順々に問い合わせを行っている。交換機に端末を接続したときには、交換機から見ると、それまで応答のなかったポートから突然応答が返ってくる事になる。この場合、交換機は同一ポートに3回問い合わせを繰り返して、全てに対し応答があれば、上記ポートの先に端末が接続されたと認識する。

【0104】逆に、交換機から端末を抜いた（端末を切断した）時には、交換機から見ると、それまで正常な応答を返していたポートから突然応答が返らなくなる。この場合、交換機は同一ポートに対し、3回続けて問い合わせを送出し、全てに対し応答がなければ、上記ポートに接続されていた端末が抜かれたと認識する。

【0105】交換機に新たに多機能ボタン電話を接続する場合について説明する。一例として電話回線（109）に多機能ボタンを接続する（図2端末Aの位置）ものとする。接続直後の問い合わせにより交換機は端末が接続された事を認識し、識別番号送信要求を送ってくる。これに対して、多機能ボタン電話機（11）はCPU（125）の制御のもとに、読み出し専用メモリ（126）に固定的に記憶している端末識別コード（機種について固有）を制御信号とし、共通バス（123）、シフトレジスタ（149）、送信フレームレジスタ（133）の制御信号領域（C）、パリティ付加回路（135）、NRZ/DP変換回路（137）、ハイブリッド回路（139）、電話回線（101）を介して交換機側に送出する。

【0106】交換機側では、この端末識別コードをラインカード（65）で受信すると、ラインカード（15）内のCPU（227）によりデータハイウェイ（233）、I/O（33）を介して、処理系のCPU（37）まで、上記端末識別コードと、これを受信したポートの番号（PN）を伝える。

【0107】CPU（37）は上記ポートに新たに多機能電話が接続されたと認識し、これらの2情報により端末に対応したデータ（カスタマーデータ等）をメモリ（41）に設定する。又、制御信号としてI/O（33）、データハイウェイ（233）ラインカード（15）、電話回線（109）を介し多機能ボタン電話（端末Aの位置）に端末識別のための識別番号（端末ごとに異なる）を送出する。

【0108】多機能ボタン電話側では、上記識別番号を、ハイブリッド（139）、DP/NRZ変換回路（141）、受信フレームレジスタ（143）、シフト

レジスタ（147）、共通バス（123）を介して電話端末CPU（125）が受信すると、CPU（125）は書き替え可能なメモリ（（126）CE² PROMで構成すればよい）内に、上記識別番号を蓄積する。このメモリの内容は、電話端末がパワーダウンしても保持される。これにより上記端末は、電話線を接続するだけで使用可能な状態となる。

【0109】使用中の多機能ボタン電話を他の場所に移動する場合について説明する。一例として、電話回線（109A）につながっていた多機能ボタン電話を電話海線（109B）につなぎ換える（端末Aの場所から端末Bの場所に移動する）場合を想定する。

【0110】電話回線（109A）、（109B）は、それぞれ交換機の端子番号（PN）1、2のポートに接続されているものとする。この電話機を回線（109A）からははずすと、前述のような問い合わせにより、交換機は電話機がPN=1ポートからははずされたと認識する。この電話機が回線（109B）に接続されると、問い合わせにより、PN=2のポートに電話機が接続された子とを交換機は認識する。交換機からは、PN=2のポートに対して識別番号送出要求を送る。

【0111】これに対し、電話機内にCPU（125）は、RAM（126）に記憶されている識別番号を制御データとして交換機に送る。交換機側では、上記識別番号をラインカード（15）、データハイウェイ（233）、I/O（33）を介して、CPU（37）が受信する。CPU（37）は識別番号から、PN=2のポートに接続された端末が、今までPN=1のポートに接続されていた多機能ボタン電話機であると認識する。そこでメモリ（41）に蓄積している端末に対応したデータ（カスタマーデータ等）の書き替えを行う。

【0112】PN=1の情報として記憶していた内容を、PN=2の情報に、そっくりそのまま移し換える。これにより、電話線を接続する動作だけで変更と同じ状態で移動後も使用可能となる。当然ながら各キーの機能の割り当て方も同一である。

【0113】多機能ボタン電話以外の標準電話機等をこの実施例での交換機に接続する場合は、上記のような問い合わせにより、交換機はあるポートに端末が接続された事を知り、識別番号送出要求を送り出すが、応答がないので、交換機は上記端末を多機能ボタン電話以外の端末だと認識する。

【0114】このとき、端末に対応したデータが既にセットされていれば、次のポートの問い合わせを行う。もし、端末に対応したデータがセットされていなければ、保守端末（45）に対し、端末（電話機）に対応したデータの打ち込み要求を送出し、入力待ちとなる。

【0115】次にメッセージの新規登録、削除、変更等を交換機側で行う場合について説明する。これは、交換機の処理としてはI/O処理で実行される。まず、端末

(45) から「ORG」とキーインする。すると、I/O処理により、「CODE?」と表示される。これに対して端末(45)から「0001」を打つ。これは、メッセージ入力用のオーソライゼーションコードである。続いて、I/O処理により、「MODE?」と表示される。これは、メッセージの入力が、新規登録か、変更か、削除化であるかを指定することをI/O処理が要求している訳である。

【0116】これに対して、端末(45)から、それぞれ、「NEW」、「CHG」、「DEL」をキーインすればよい。キーインの後、「NUMBER?」と「MESSAGE?」という問い合わせがされるので、これに従って、識別子、メッセージを入力していけばよい。

【0117】このようにしてI/O処理において、メッセージの新規登録、変更、削除等が終了したなら、この旨がバックグラウンドジョブに伝えられ、変換処理のあい間に、メッセージ、識別子(変更部分だけでもよい)が電話端末(11)へ送られる。

【0118】次にディスプレイを持たない電話機、すなわち、標準電話機がこの実施例での交換系に接続された場合のメッセージ転送について説明する。ここでは、メッセージを音声に変換して標準電話機に転送するものとする。このときの全体構成は、図22に示されるように、交換機(13)側に音声合成回路(301)が設けられている点の特徴である。

【0119】この音声合成回路(301)は、図23に示されるように、CPU(303)と、ROM(305)と、RAM(307)と、I/O(311)とを備えている。CPU(303)は、ROM(305)内に記憶されたプログラムに従って処理を行う。又、ROM(305)内には、音声合成用の単語辞書、規則合成用パラメータデータそして前述の識別子とメッセージとの対応をも記憶している。

【0120】もちろん、この対応は、RAM(307)に記憶させてもよい、RAMに記憶させる場合には、内容をセットする方法が前述のとおりいくつか考えられる。

【0121】メッセージ転送を交換機が行う場合、前述のように転送先端末の状態をカスタマデータから得ている。この結果転送先が標準電話機であると、交換機(13)のCPU(37)は、識別子(更に可変データが付加される場合もある。)を上記の音声合成回路(301)に送る。これは、データハイウェイ(233)を介して行う。CPU(303)はI/O(311)、共通バス(309)を介して識別子を受け取ると、音声合成処理を開始する。

【0122】例えば、今、識別子+可変データとして「50300」がCPU(303)に送られたとする。まず、これに対して、「5」に対応したメッセージをROM(305)から読み出す。そして「カイギチュウ0

3:00マデ」の形に変換する。これを以下に述べるように、音声合成を行い、8KHz間隔のPCM音声データに変換する。図24には、音声合成の処理フローを示す。上記のようなメッセージデータに対して、各単語毎に単語辞書を参照して読みとアクセントとを与える。この例では、「03:00」に対して「サンジ」という読みが与えられる。

【0123】次に、文節としてのアクセント及びポーズが与えられ、話し言葉への変換が行われる。続いて、音声パラメータをもとに、規則音声合成が行われ、8KHz間隔のPCMデータ「カイギチュウ サンジマデ」が得られる。このデータがPCMハイウェイ(17)を介して、ラインカード(15)に送られる。

【0124】このPCMデータは、ラインカードにおいて、アナログ音声信号に変換されて、標準電話機(321)へ送られ、メッセージ転送が成される。このとき、登録されたメッセージである事を示す音や案内文をメッセージの前に付加してもよい。又、メッセージ送出を標準電話機(321)において送受話器を置くまで回復しても良い。

【0125】以上、この説明の実施例につき説明したが、この発明は、この実施例に限定されるものではない。例えば、交換機のCPUメモリ等をラインカード、トランクカード等に分散させて、メッセージを各々のカードのメモリに蓄積しても良く、交換機と電話端末の間の伝送方式、フォーマットとも本発明に限るものではない。電話端末においても、CRT、LED、LCD、その他どのようなディスプレイでもよく、キー配列、キー操作も本実施例に限るものではない。

【0126】メッセージ選択にしても、例えばダイヤルパッド等で直接識別子を選択してもよく、本方式に限るものではない。電話端末に接続できるデータ端末でタブレット等についてもなくてもよいことは明白である。又、メッセージ例、制御信号コードについても本実施例に限るものではないことは明白である。又、メッセージに対する識別子の設定も実施例には限定されない。

【0127】実施例においては、会社内での使用頻度が高いメッセージを固定メッセージとして捉え、これらを識別子により識別したが、どのようなメッセージに対して識別子を付与するかは、システムにおいて任意に決定されるものである。又、識別子としては、実施例のように数字を与えてもよいし、記号を用いてもよい。又、メモリのアドレスを識別子に用いてもよい。又、メッセージは、電話端末全てについて共通する必要は必ずしもなく、電話端末により使用できるメッセージに制限をつけてもよい。

【0128】

【発明の効果】本発明によれば、メッセージの通信に際し、回線上传送するのは識別子と可変メッセージであるため、より具体的なメッセージを受信者に知らせること

ができるため、受信者はより適切な対応をすることができ、かつメッセージのうち固定のものに関しては識別子を利用するため伝送量の削減をすることができ、よって伝送時間の短縮を図れることができる。

【0129】例えば、「ただいまがいしゅつちゅう3:00キシャ」というメッセージを送る場合には、「3:00」は識別子ではなくキャラクターといった可変メッセージで伝送する。

【図面の簡単な説明】

- 【図1】 この発明の特徴を示す図
- 【図2】 一実施例に係わるシステムの全体構成図、
- 【図3】 この実施例で用いている二線式双方向バースト伝送方式（ピンポン伝送方式）を説明するための図、
- 【図4】 ピンポン伝送での信号フォーマット、
- 【図5】 制御信号がマルチフレーム構成であることを示す図、
- 【図6】 NRZ信号とDP信号別を示す図、
- 【図7】 この実施例で用いるディスプレイ付電話端末の外観図、
- 【図8】 図7に示すディスプレイ付電話機の電氣的構成図、
- 【図9】 図8中のハイブリッド回路（139）周辺の具体的回路図、
- 【図10】 図2に示されるシステム中のラインカード（15）の具体的構成図、
- 【図11】 図7に示されるディスプレイ付電話端末での表示例（ソフトキーの表示例）を示す図、
- 【図12】 交換機内に記憶されたポート対応のカスタ

マデータ、及びセット中メッセージを示す図、

【図13】 状態遷移図

【図14】 メッセージ設定要求時のデータフォーマットを示す図、

【図15】 メッセージ送出要求時のデータフォーマットを示す図、

【図16】 交換機内のCPU（37）の処理を説明するためフローチャートを示す図、

【図17】 図16でのイニシャルプログラムの具体的処理手順を示す図、

【図18】 実装マップ作成時の問い合わせ及び応答のフォーマットを示す図、

【図19】 図2に示す端末（45）からメッセージを入力する際の具体的入力手順例を示す図、

【図20】 交換機側から端末側へ識別子メッセージを初期設定する場合に用いる信号のフォーマットを示す図、

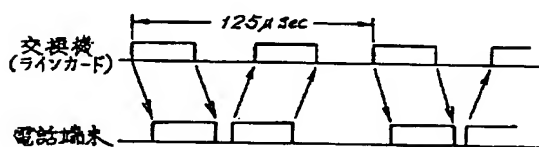
【図21】 交換動作のあい間等に行われる端末の接続状態をチェックし、カスタマデータを自動的に更新する処理の流れを示す図、

【図22】 端末として標準電話機が混在する場合の全体構成図、

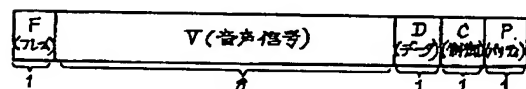
【図23】 図22中の音声合成回路（301）の具体的構成図、

【図24】 図23の音声合成回路において、メッセージデータからPCM音声データを得るための処理を示す図である。

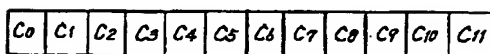
【図3】



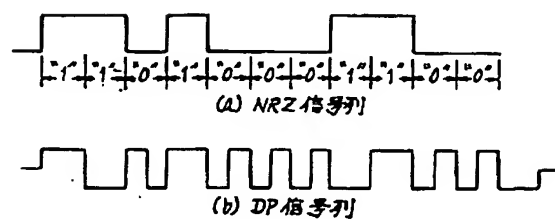
【図4】



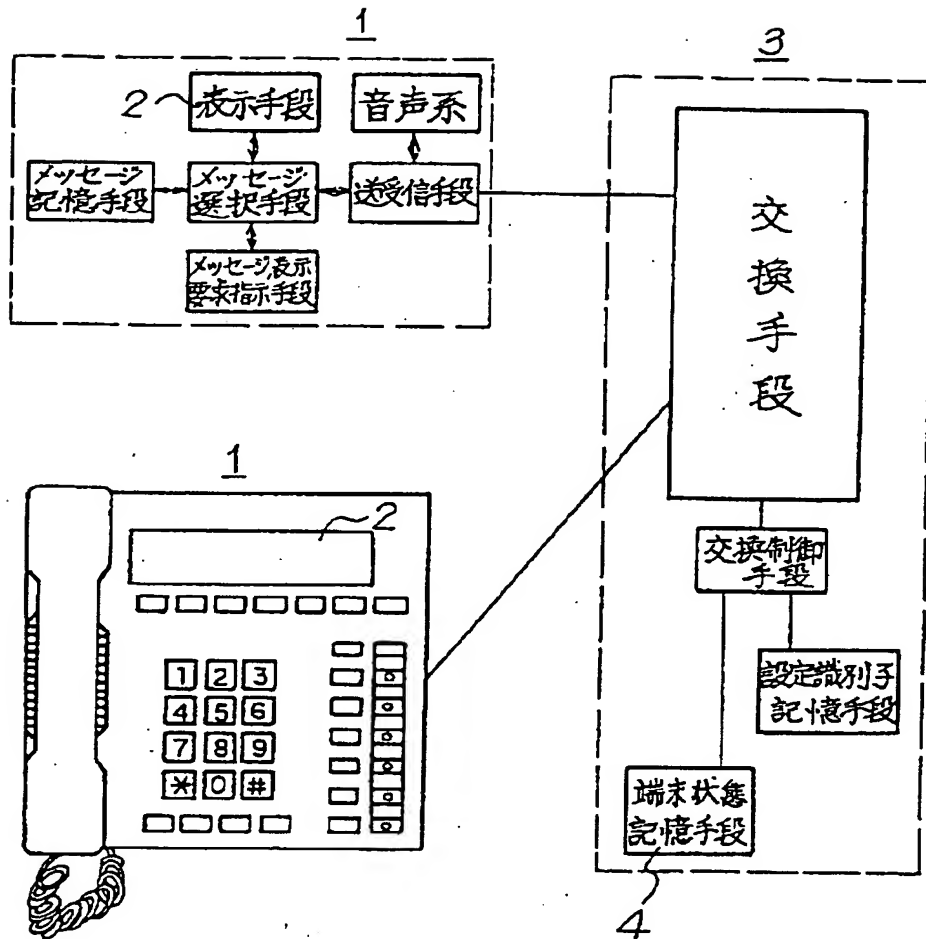
【図5】



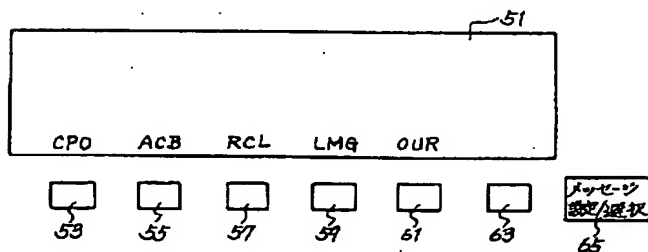
【図6】



【図1】



【図11】



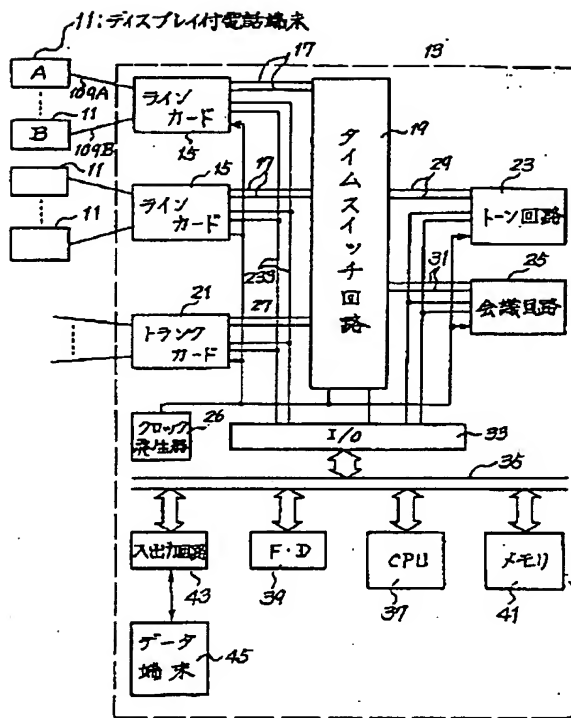
【図18】

C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	
1	1	0	0	0	0	0	0	0	0	0	1	1	同合カビ
1	1	0	0	0	0	0	0	0	0	1	1	0	応答

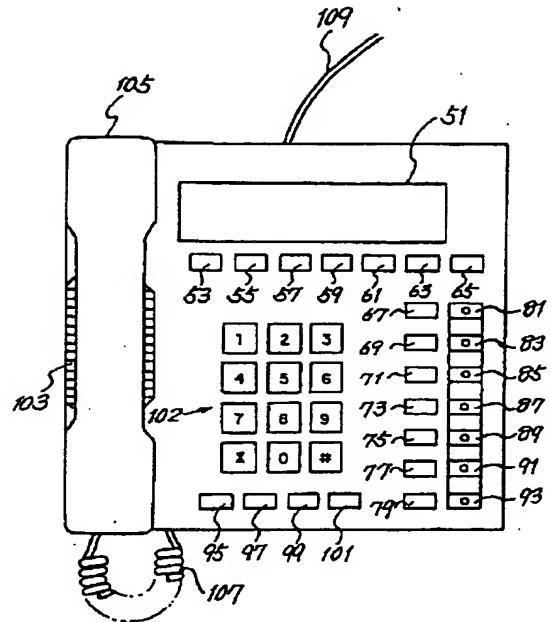
【図12】

ポート No.	カスタマデータ			セット中メッセージ		
	端末 識別	Tel No.		状態	識別子	可変データ部
0						
1						
2						
3						
i	ガス アライ	2821		7	5	0300
j						
P						

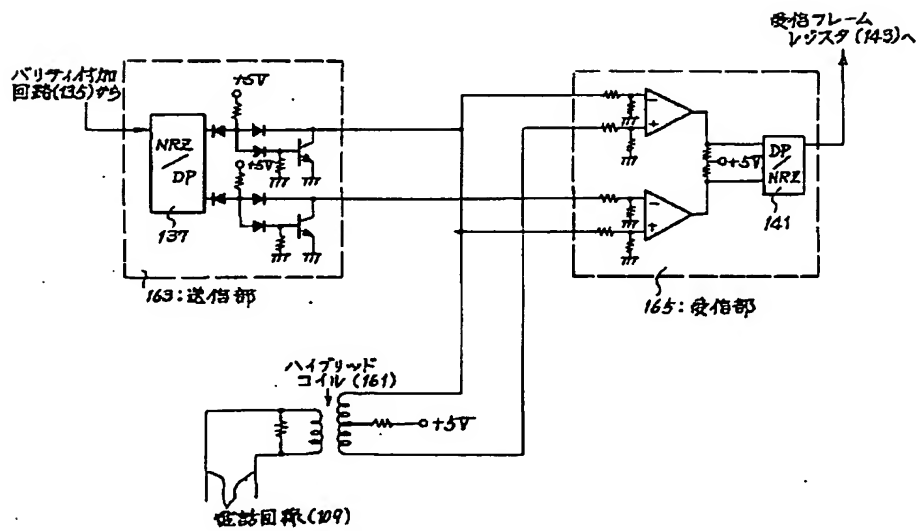
【図2】



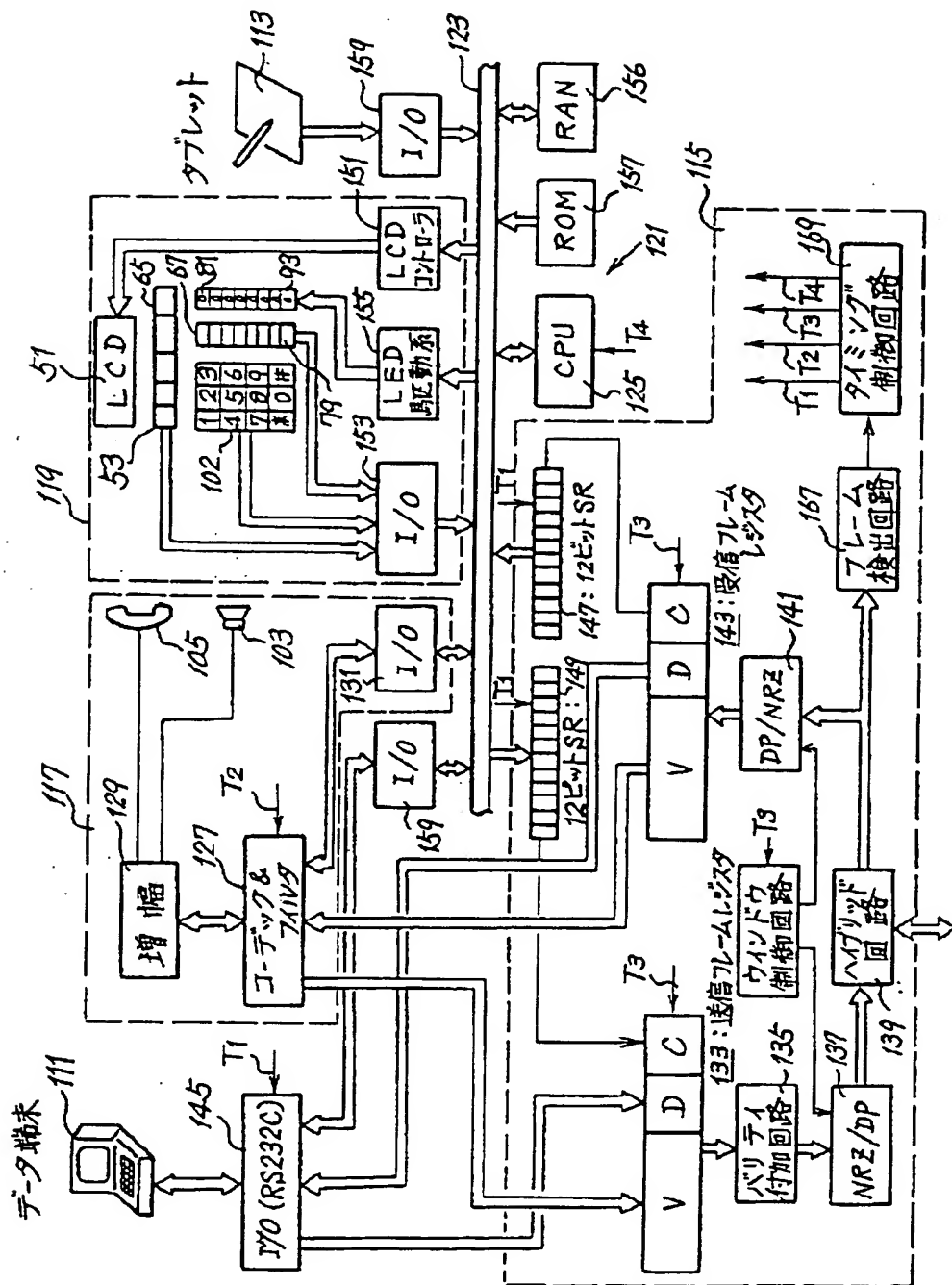
【図7】



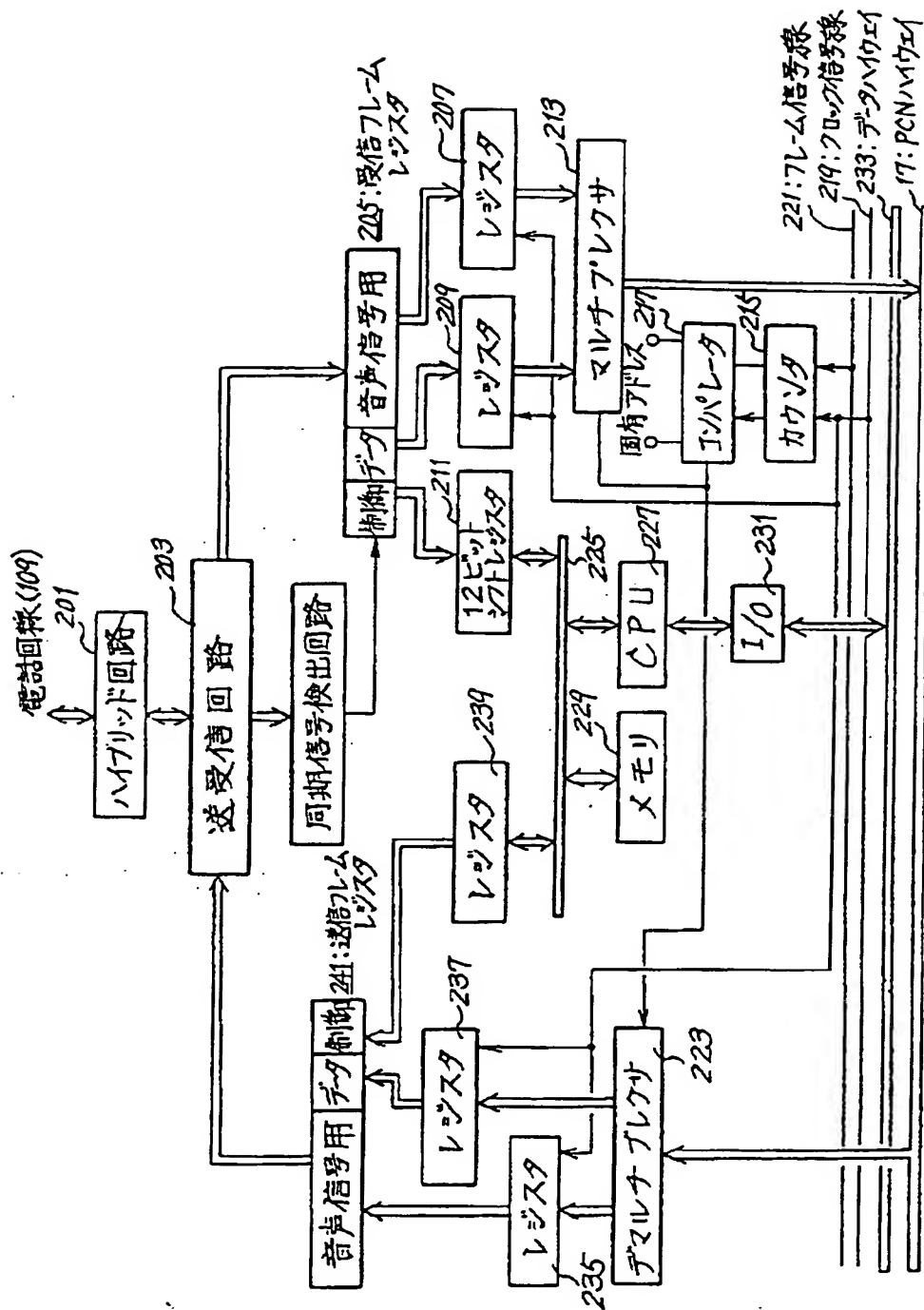
【図9】



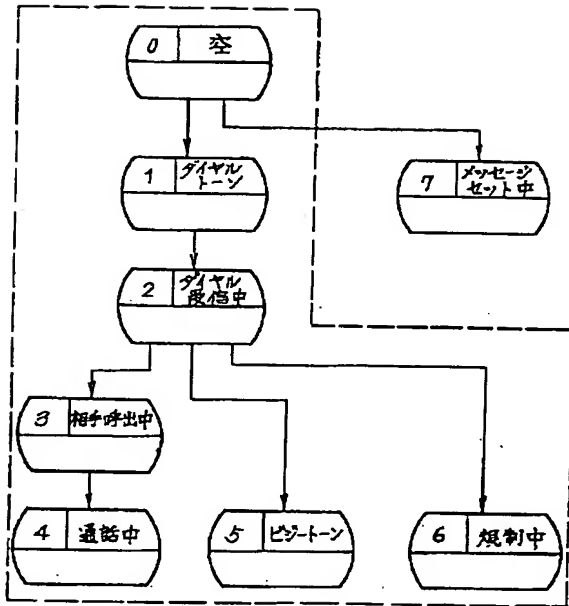
【图8】



【図 10】



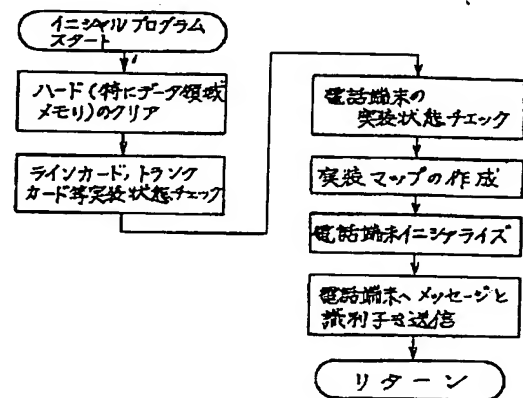
【図13】



【図15】

C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	
1	0	1	1	0	0	0	0	0	0	0	1	メッセージ送出要求
1	1	1	0	0	0	0	0	1	1	0	1	メッセージの識別子
1	0	1	1	1	0	0	0	0	0	0	0	メッセージ送出終了

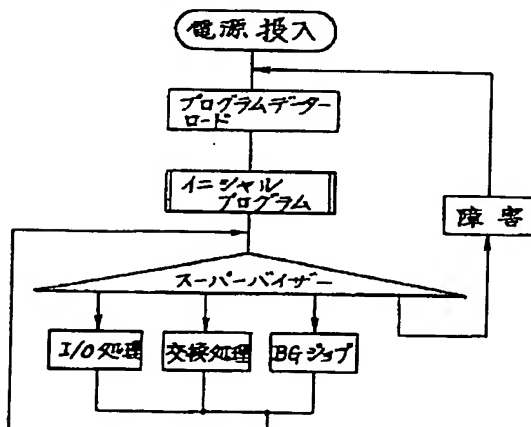
【図17】



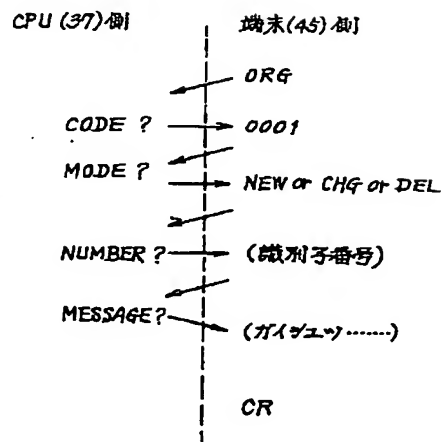
【図14】

C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	
1	0	1	0	0	0	0	0	0	0	1	1	メッセージ設定要求
1	1	1	0	0	0	0	0	1	0	1	1	メッセージの識別子番号
1	0	0	0	0	0	0	0	0	0	0	1	時間、月日などの メッセージの中の 可変データ
1	0	0	0	0	0	0	0	0	1	1	1	
1	0	0	0	0	0	0	0	0	0	0	1	
1	0	0	0	0	0	0	0	0	0	0	1	
1	0	1	0	0	0	0	0	0	1	1	0	メッセージ設定終了

【図16】



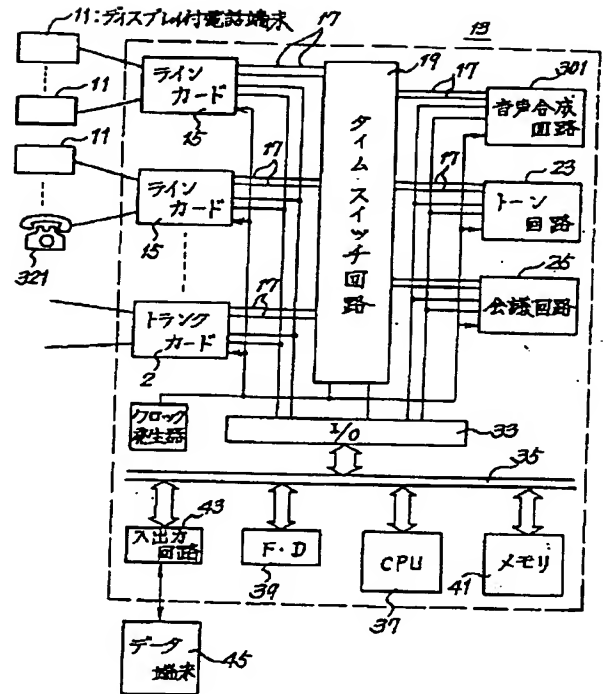
【図19】



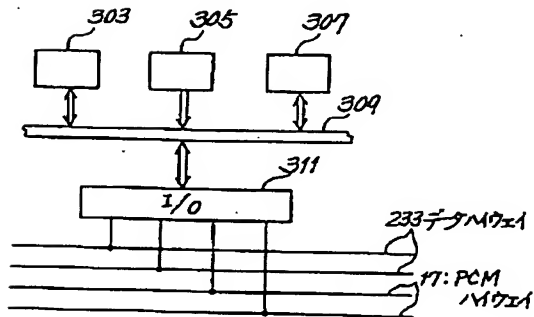
【図20】

C ₀	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	C ₇	C ₈	C ₉	C ₁₀	C ₁₁	
1	0	1	0	0	0	0	0	1	0	0	1	メッセージ 配格要求
1	1	1	0	0	0	0	0	0	0	1	0	メッセージの 識別子番号
1	0	0										メッセージ
1	0	0										
1	0	0										
1	0	0										
1	1	1	0	0	0	0	0	0	1	0	0	メッセージの 識別子番号
1	0	0										メッセージ
1	0	0										
1	0	0										メッセージの 記憶命令

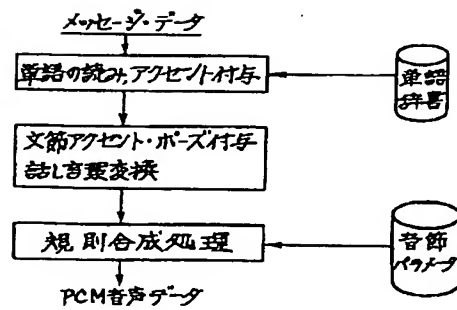
【図22】



【図23】



【図24】



```

graph TD
    Start([開始]) --> SendQ1[問い合わせ送出]
    SendQ1 --> WaitR1[応答待ち]
    WaitR1 --> HasR1{応答有り?}
    HasR1 -- NO --> HasR2{前回応答無し?}
    HasR1 -- YES --> HasR3{前回応答有り?}
    HasR2 -- YES --> SendQ2[問い合わせ送出]
    HasR2 -- NO --> HasR4{過去3回応答無し?}
    HasR3 -- YES --> SendQ2
    HasR3 -- NO --> HasR4
    HasR4 -- YES --> SendQ2
    HasR4 -- NO --> HasR5{過去3回応答有り?}
    HasR5 -- YES --> Judge1[端末接続されたと判定]
    Judge1 --> SendID[識別番号送信要求]
    SendID --> WaitR2[受信待ち]
    WaitR2 --> HasR6{応答有り?}
    HasR6 -- YES --> HasR7{既登録Noか?}
    HasR6 -- NO --> SendID
    HasR7 -- YES --> Judge2[既使用多機能電話と判定、カスタマデータの置き換え]
    Judge2 --> SendQ3[次のポートに対して問い合わせ送出]
    HasR7 -- NO --> Judge3[新規多機能電話接続と判定、カスタマデータの設定、端末に識別番号送出]
    Judge3 --> SendQ3
    HasR8{カスタマデータ既セリ?} -- NO --> SendC[端末(45)にカスタマデータの打ち込み要求送出]
    SendC --> SendQ3
    HasR8 -- YES --> SendQ3
    SendQ3[次のポートに対して問い合わせ送出]

```